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Welcome to the University of North Dakota!

This catalog is really a roadmap; it describes more than 150 possible pathways to a bright future. Because of the need to compress a lot of information in a small space, most of the catalog describes degree programs, courses, and the names of faculty and their qualifications. The narrative doesn’t begin to convey the dynamic nature of the learning environment at the University of North Dakota and the rich opportunities students have to work with highly qualified faculty in the active pursuit of learning.

This volume also outlines the basic framework of university policies and procedures and the structure of the curriculum. The catalog begins with general information about the student body — the kinds of students with whom you will learn and grow; to give you some important context, it goes on to describe the mission, scope, and history of one of America’s great universities. This catalog also contains important information about a host of special services designed to ensure student success in learning.

Be assured that the University of North Dakota is organized first and foremost to prepare its graduates for a lifetime of success, regardless of how the world changes — for it surely will. Welcome to the learning community of the University of North Dakota, and to the next important stage in your personal development as a life-long learner.

Sincerely,

Mark R. Kennedy
# 2016-17 Academic Calendar

*(Subject to Change)*

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<td>Beginning of instruction, 4 p.m. August 21</td>
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<td>Last day for advancement to candidacy for all graduate students planning to graduate in December August 21</td>
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<td>Last day to add a full-term course or drop without record August 30</td>
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<td>Last day to change to or from audit grading for a full-term course August 30</td>
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<td>Holiday, Labor Day September 4</td>
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<td>Last day for students to submit incomplete work from Spring and Summer to instructors or petition for extension of incomplete September 15</td>
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<td>Last day graduation candidates may apply for a degree September 19</td>
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<td>Last day for instructors to submit Removal of Incomplete Grade form to Registrar September 29</td>
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<td>Last day to drop a full-term course or withdraw from school November 9</td>
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<td>Last day to change to or from S/U grading for a full-term course November 9</td>
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<td>Holiday, Veteran's Day November 10</td>
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<td>Last day to submit Thesis/Dissertation “Preliminary Approval,” “Notice of Defense” and format copy to the School of Graduate Studies July 5</td>
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<td>Last day to drop full-term course or withdraw from school July 13</td>
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<td>Last day to change to or from S/U grading for a full-term course July 13</td>
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<td>Last day for Thesis/Dissertation Defense July 19</td>
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<td>Last day for faculty to submit “Final Report on Candidate” form to the School of Graduate Studies July 26</td>
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<td>Last day to submit final copy of electronic Thesis/Dissertation for publishing July 26</td>
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<td>Reading and Review Day July 26</td>
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<td>Winter Commencement and Official Graduation Day August 3</td>
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<td>Grades due from faculty to the Office of the Registrar at noon CST August 7</td>
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**All academic deadline dates apply to full-term, on-campus courses.**
Notices

Satisfactory Progress

Any time you drop a course or withdraw from the University, you may be jeopardizing your federally funded student financial aid, now or in the future. You must successfully complete at least two-thirds of all the courses in which you enroll. Dropping after the first day of class may not affect your academic standing, but it may affect your ability to receive financial aid. Please review this policy and other pertaining to your financial aid in the Code of Student Life in the appendix section titled “A Summary of the Standards of Satisfactory Progress for Financial Aid Eligibility,” or contact the Student Financial Aid Office.

Notice of Nondiscrimination

The University of North Dakota (UND) is committed to the principle of equal opportunity in education and employment. UND does not discriminate on the basis of race, color, national origin, religion, sex, age, disability, sexual orientation, gender identity, genetic information, creed, marital status, veteran’s status, political belief or affiliation or any other status protected by law. Equal opportunity and access to facilities shall be available to all. This policy is applicable in employment, admissions and University-sponsored or approved programs and activities.

Pursuant to Title IX of the Education Amendments of 1972, UND does not discriminate on the basis of sex in its educational programs and activities, employment and admission. UND will promptly and equitably investigate reports of discrimination or harassment and take disciplinary action as appropriate. Information regarding sexual violence and Title IX can be found at http://UND.edu/affirmative-action/title-ix/.

Retaliation in any form against a person who reports discrimination or participates in the investigation of discrimination is strictly prohibited and will be grounds for separate disciplinary action.

Concerns regarding UND’s equal opportunity and nondiscrimination policies, including Title IX, Title VI, Title VII, ADA, and Section 504 may be reported at http://und.edu/affirmative-action/incident-report.cfm or may be addressed to Donna Smith, Director of Equal Employment Opportunity/Affirmative Action and Title IX/ADA Coordinator, 401 Twamley Hall, 264 Centennial Drive Stop 7097, Grand Forks, ND 58202-7097, telephone 701.777.4171, email UND.affirmativeactionoffice@UND.edu or donna.smith@UND.edu (donana.smith@UND.edu) or visit the website at http://und.edu/affirmative-action/.

A complaint or concern regarding discrimination or harassment may also be sent to the Office for Civil Rights, U.S. Department of Education, 500 West Madison, Suite 1475, Chicago, IL 60611 or any other federal agency.

Sexual and Gender-Based Discrimination and Harassment, including Sexual Violence

UND prohibits discrimination and harassment of students, faculty staff and visitors based upon sex and gender. Sexual harassment is a form of sex discrimination and includes sexual violence, such as rape, dating violence, domestic violence, stalking, sexual abuse, sexual assault, and sexual coercion. Prohibited harassment also includes:

- Acts of verbal, nonverbal or physical aggression, intimidation or hostility based on sex, even if those acts do not involve conduct of a sexual nature
- Sex-based harassment by those of the same sex
- Discrimination and harassment of LGBTQ+ individuals
- Sexual violence

If you have experienced sexual violence or other sex or gender-based discrimination or harassment, you are encouraged to report the incident at http://und.edu/affirmative-action/incident-report.cfm or to contact UND’s Title IX Coordinator at 701.777.4171 or by email at donna.smith@UND.edu. UND will take prompt action to eliminate the harassment, prevent its recurrence, and eliminate its effects.

Under Title IX, most UND employees are required to share complaints of sexual violence and sexual harassment with the Title IX Coordinator. They are not allowed to keep a report of sexual violence completely confidential. This is because UND has resources and support available to help. We are concerned for the safety and well-being of the victim as well as the campus and community. This does not mean an investigation or other process will occur against the complainant’s wishes.

Respecting a complainant’s privacy is important to UND. Information will only be shared with individuals who need to know to provide resources for the complainant, to protect the safety of the campus community or for investigative needs. If a complainant does not want his or her name revealed to the respondent, UND will do its best to honor that request. Our ability to fully respond may be limited.

A confidential report of sexual violence can be made on-campus at University Counseling Center, Student Health Services, Community Violence Intervention Center, and UND’s Employee Assistance Program. These offices will not report incidents of sexual violence to the Title IX Coordinator in a way that identifies the complainant without the complainant’s consent. You can make a confidential report and still receive counseling or other services through these departments.

More information about sexual and gender-based violence and Title IX at UND can be found at http://und.edu/affirmative-action/title-ix/ or by contacting UND’s Title IX Coordinator at 701.777.4171 or donna.smith@UND.edu.

UND Statement on Institutional Diversity and Pluralism

Approved by University Senate December 7, 2006

The University of North Dakota takes pride in its mission to meet the individual and group needs of a diverse and pluralistic society through education, research, and service. The peoples served by and associated with the University vary widely; all must be valued for the richness their different cultures, heritages, perspectives, and ideas bring to the community. The University is in part, a conduit through which individual perspectives and global interrelationships are enhanced by a learning and teaching environment that is aware of and sensitive to the diversity of its constituents. Diversity in the University is constituted by the full participation of persons of different racial and ethnic heritage, age, gender, socio-economic background, religion, and sexual orientation; of persons with disabilities; and of people from other countries. Of special and particular importance is the University’s longstanding commitment to the education of American Indian students and the cultures and traditions of the American Indian people. In addition, the University’s commitment to diversity extends to historically underrepresented populations such as African Americans, Latino Americans, and Asian Americans. Furthermore, the University embraces our international student population as they enhance the culturally rich learning environment of campus. The University is committed to providing learning and teaching experiences which enhance all students’ self-determination, educational advantages, and professional opportunities. Policies and procedures of the University oblige its students, faculty, staff, and alumni to foster the awareness and sensitivity necessary for acceptance and understanding of all people in society. The University of North Dakota strongly disapproves and does not tolerate acts of racism, sexism, bigotry, harassment, and violence in any form and actively uses its human and other resources to provide opportunities for its constituents and public to learn and appreciate the values of a diverse and multicultural world.

Disability Access On Campus

The University of North Dakota is committed to providing access to all people using its facilities, programs and services. UND is responsible for making reasonable accommodations and adjustments to ensure there is no discrimination on the basis of disability, as established under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act.

For building access or other physical barriers, contact the Facilities Department 24-hour call line at 701.777.2591 or use Relay 711.

For student accommodations, contact Disability Services for Students at 701.777.3425 und.dss@und.edu or register with DSS at http://und.edu/disability-services/.
For employee accommodations, requests should be directed to the employee’s supervisor or the ADA Coordinator at 701.777.4171. An ADA Accommodation request form and related information is located at http://und.edu/affirmative-action/ada.cfm.

**Code of Student Life**

The University of North Dakota *Code of Student Life* is available online to all students. The Code outlines the rights and responsibilities enjoyed by the students, faculty, and staff who make up the University community. The purpose of the information contained in the *Code of Student Life* is to promote and maintain a learning environment appropriate for an institution of higher education and to serve as a basic guide to help prevent abuse of the rights of others. Members of the University community are expected to be familiar with the rules and regulations contained within the Code and to act in compliance with them at all times. Nothing within the Code is intended to limit or restrict freedom of speech or peaceful assembly. You can access the Code at: http://und.edu/code-of-student-life/.

**Required Immunization & Tuberculosis Screening Documentation**

Students enrolled in a course offered for credit at any North Dakota University System (NDUS) institution must provide documentation of certain vaccines received and appropriate Tuberculosis (TB) screening as described in North Dakota State Board of Higher Education (SBHE) Policy 506.1.

The University of North Dakota requires documentation of the following:

1. 2 doses of MMR (measles, mumps, and rubella) vaccine.
2. 1 dose of Meningitis (Menactra/Menveo) vaccine given after the 16th birthday.
3. Completion of the Tuberculosis (TB) screening form. If a student qualifies as “high risk” according to the screening form, he/she will be required to have TB testing done or provide documentation of TB testing done with the past 6 months performed within the United States.

For more information please contact UND Student Health Services at (701) 777-4500, 1.800.CALL.UND ext. 4500, or visit the UND Student Health Services web page at: http://und.edu/immunizations.

**Security Compliance**

The University of North Dakota is in compliance with the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act (Clery Act) formerly known as the Crime Awareness and Campus Security Act of 1990. The University of North Dakota publishes an Annual Security and Fire Safety Report. The report includes the university’s policies, procedures, and programs concerning safety and security, as well as three years’ of crime statistics for our campus. As a community member, you are entitled to a copy of this report. The report and statistical data can be found online at http://und.edu/discover/_files/docs/annual-security-report.pdf. You may also request a paper copy of the report from the UND Police Department located at 3851 Campus Road, Grand Forks, ND, 58202. For more information, contact the UND Department of Public Safety at (701) 777-3491, visit the UND Department of Public Safety web page at: http://und.edu/public-safety/, or e-mail: und.police@email.und.edu (undpolice@und.edu).

**Email Policy**

Electronic mail or “email” is considered an official method for communication at UND because it delivers information in a convenient, timely, cost effective, and environmentally aware manner.

A University assigned student email account shall be the University’s official means of communication with all students on the UND campus. Students can expect to receive official information regarding deadlines, policy/procedure changes, changes in degree requirements, special events, course schedule changes, regulatory changes, emergency notifications, as well as other useful information from the Registrar, Office of Financial Aid, Student Account Services, the Provost’s Office, Dean of Students, the School of Graduate Studies, academic departments, and other entities affiliated with the University. Students are responsible for all information sent to them via their University email account. For additional information, please visit the CIO website at: http://cio.und.edu/.

**Tobacco-Free Campus Policy**

The University of North Dakota is a tobacco-free campus. Tobacco use is prohibited within University buildings, parking structures, walkways, arenas, in University or state vehicles, and on UND property. UND provides comprehensive tobacco cessation and prevention services. See http://www.tobaccofree.und.edu for more information.

**Catalog Content Non-Binding, Subject-to-Change Statement**

Catalogs and bulletins of educational institutions are usually prepared by faculty committees or administrative officers for the purpose of furnishing prospective students and other interested persons with information about their institution. Information contained in such printed material is subject to change without notice, and it is not to be interpreted as creating a binding obligation on the institution and the State. In times of changing conditions, it is especially necessary to have this understood.

**Suggestions and Complaints**

The University welcomes suggestions and/or complaints from students, faculty, and staff, which should be directed to the unit or personnel most directly involved. It is only in this way that the institution can become aware of potential problems and take appropriate action. Also available are anonymous hot lines which deal with general concerns and scientific or ethical misconduct. The URLs are respectively: http://www.und.edu/dept/fraudhotline/index.html and http://www.und.edu/dept/rcd/reporting%20scientificmisconduct.html. The University may review with accrediting agencies a log of anonymously tracked written student complaints.

**Access to Records (Family Educational Rights and Privacy Act)**

In compliance with the Family Educational Rights and Privacy Act of 1974 as amended, the University of North Dakota has developed policy guidelines for access to the education record with respect to the rights of eligible students and parents of dependent eligible students. All information contained in University records is considered confidential, except for directory information, which may be released publicly in printed, electronic, or other form. Directory information is defined in the Code of Student Life in “Section X: Student Records/Directory Information.” Students who wish to restrict their directory information from public release should restrict their information as early in the term as possible. To ensure restriction of directory information from the printed material, the process should be completed by the tenth day of classes in the fall semester. To restrict directory information, students should go to the Office of the Registrar, Room 203, Twamley Hall.

**UND Graduation Rate Information**

The University of North Dakota graduation rate information is available online at: www.und.edu/academics/registrar/graduation-rates.cfm. A paper copy of this report is also available by calling the Office of the Registrar at (701) 777-2711.

This CATALOG was published by the University of North Dakota Office of the Registrar, Scott Correll, Registrar, and the UND School of Graduate Studies, Grant McGimpsey, Dean.
General Information

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  - Assessment, the Academic Year, Programs of Study (p. 11)
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The University: Scope, History, Mission, Accreditation

The Scope of the University

Classified as a high research activity, doctoral/professional and engaged university by the Carnegie Foundation for the Advancement of Teaching, the University of North Dakota is a coeducational, state-supported institution which recorded an enrollment of 14,648 students in the fall of 2016. UND is located in Grand Forks, a city of 54,000 situated across the Red River from East Grand Forks, Minnesota, about 300 miles northwest of Minneapolis and 150 miles south of Winnipeg.

This university is characterized by a solid foundation in the liberal arts, a manageable size, high-quality students and faculty, a comprehensive curriculum, a widely recognized program of graduate education and research, law and medical schools praised for quality and innovation, rich cultural resources, and an outstanding record of alumni support.

The University's undergraduate and graduate programs are offered in 228 fields of study through the College of Arts and Sciences (which includes a major division devoted to music, theater and art), Odegard School of Aerospace Sciences, College of Business and Public Administration, College of Engineering and Mines, College of Nursing and Professional Disciplines, College of Education and Human Development, School of Law, School of Medicine and Health Sciences, and School of Graduate Studies (offering the doctorate in 38 programs, the specialist's degree in one program, and the master's degree in 63 programs).

In the fall of 2016, about 35 percent of UND's students were residents of North Dakota and about 34 percent were from Minnesota, with the remainder representing every other state, Canada, and about 50 other countries. Some 77 percent were enrolled in UND's undergraduate programs. The University awarded 3,304 degrees in 2015-2016, including 2,115 undergraduate degrees, 740 master's degrees, 134 doctoral degrees, 75 law degrees, 73 M.D. degrees, and 86 post-bachelor/post-master certificates.

The University received a total of $118.4 million in external research awards in fiscal year 2016. UND's sponsored research programs had a state and regional economic impact of $197.2 million in fiscal year 2015.

Faculty at the University number 810, with a total workforce of 2,643.

UND's 521-acre campus, regarded as one of the most beautiful in the region, includes 244 buildings and more than 6.8 million square feet of space. Facilities include the Gorecki Alumni Center, the gateway to campus, the Wellness Center, and the Ralph Engelstad Arena, home of the University's NCAA Division I ice hockey program. The Alerus Center, a 22,000-seat events and conference facility, joins such venues as the Fire Hall Theatre, Empire Arts Center, and North Dakota Museum of Art, as well as UND's Chester Fritz Auditorium, Buntness Theatre and Hughes Fine Arts Center in bringing cultural, entertainment, and athletic programming to the community. New construction includes a four-story School of Medicine and Health Sciences, renovation and addition to the School of Law, Wilkerson Commons, the Collaborative Energy Complex, and the Athletic High Performance Center.

Brief History of UND

The University of North Dakota at Grand Forks was founded in 1883 by the Dakota Territorial Assembly, six years before North Dakota became a state. The cornerstone for the first building was laid that autumn. Four faculty members met the 11 students who entered the University on opening day, September 8, 1884. The first class was graduated in 1889. Unlike most state institutions of higher education west of the Mississippi, UND did not begin as an agricultural school or only as a teachers college. Organized initially as a College of Arts and Sciences, with a Normal School for the education of teachers, UND soon evolved into a full-fledged multi-purpose university. Instruction of graduate students (the first master's degree was awarded in 1895) and the conducting of research were under way before the end of the 19th century. The University has withstood multiple challenges to prosper as an institution of national caliber.

The University today would be recognizable to its founders. UND was the only institution of higher education in the state to be originally established as a university, with all of the implications of that title. A university has an obligation to preserve knowledge, to disseminate knowledge, and to create new knowledge. The University of North Dakota has served as a capstone for the entire system of public education in the state, and from its earliest year has embraced all levels of higher education—undergraduate, professional and graduate—and maintained an active program of research and service. The University has created a tradition in instruction, research, and service which has served as a model for other institutions. Consistent with the intent of the founding legislators, the University serves as a standard-bearer and leader for higher education in the state.

Mission of the University

The following mission statement is on file with the State Board of Higher Education:

The University of North Dakota, as a member of the North Dakota University System, serves the state, the country and the world community through teaching, research, creative activities, and service. State-assisted, the University's work depends also on federal, private, and corporate sources. With other research universities, the University shares a distinctive responsibility for the discovery, development, preservation and dissemination of knowledge. Through its sponsorship and encouragement of basic and applied research, scholarship, and creative endeavor, the University contributes to the public well-being.

The University maintains its legislatively enacted missions in liberal arts, business, education, law, medicine, engineering and mines; and has also developed special missions in nursing, fine arts, aerospace, energy, human resources and international studies. It provides a wide range of challenging academic programs for undergraduate, professional, and graduate students through the doctoral level. The University encourages students to make informed choices, to communicate effectively, to be intellectually curious and creative, to commit themselves to lifelong learning and the service of others, and to share responsibility both for their own communities and for the world. The University promotes cultural diversity among its students, staff, and faculty.

In addition to its on-campus instructional and research programs, the University of North Dakota separately and cooperatively provides extensive continuing education and public service programs for all areas of the state and region.

Accreditation

The University of North Dakota has been accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools since the Association was organized in 1913. UND received its most recent reaffirmation of institutional accreditation in 2013-14. Many individual colleges, schools, and departments are members of accrediting associations in their respective fields. The address and telephone number for the Higher Learning Commission of the North Central Association are: Higher Learning Commission, 230 S. LaSalle St., Suite 7-500; Chicago, IL 60604-1411; telephone numbers are (800) 621-7440 or (312) 263-0456; fax number is (312) 263-7462; website address is: http://www.hlcommission.org/; e-mail address is inquiry@hlcommission.org (info@hlcommission.org).
Assessment, the Academic Year, Programs of Study

Assessment

The University of North Dakota is committed to assessment of student learning as part of an ongoing effort to improve teaching and learning in courses and programs across campus. Every degree-granting program offered at UND has identified goals for student learning within the program. Learning outcomes are identified in several areas outside the major as well, including the institution as a whole, the Essential Studies program, and many student services programs. Each program with identified learning outcomes has also developed a plan for assessing learning in relation to those goals; assessment activities are carried out yearly and reported in the departmental annual assessment report, as described in the University Assessment Plan. For more information about assessment planning, activities, and findings, or to see assessment plans for various programs or the University Assessment Plan, please see the website of the University Assessment Committee at: http://www.und.edu/university-senate/assessment/.

The Academic Year

The academic year is divided into two semesters, each approximately 16 weeks in length: the first, beginning near the end of August and ending prior to Christmas; the second, beginning in mid-January and extending to mid-May. A Summer Session begins in May and concludes in August. The UND Summer Session offers a variety of courses, workshops, institutes and special programs of various lengths. See the academic calendar (p. 7).

Programs of Study

The University of North Dakota’s academic programs are described elsewhere in this catalog. Please see the listings of the colleges and schools and listings of the undergraduate and graduate departments and program areas. See also the A-Z index (http://und.edu/a-z) or the Fields of Study list on the web at: www.und.edu/academics/Registrar/fields-of-study.cfm.

Visitor Information

Visitors are always welcome at the University of North Dakota. See http://und.edu/discover/visit.cfm for maps and other information.

Office Hours

8 a.m. to 4:30 p.m. Monday through Friday, although some buildings such as the libraries, Museum, and Memorial Union are open extended hours, including weekends.

Campus Visit Information

A campus visit is a great way to experience university life and see firsthand what awaits you at UND. Stop at the Gorecki Alumni Center located on the corner of University Avenue and Stanford Road to schedule your campus visit with the Office of Admissions or go online at: www.go.und.edu. To provide you with the best experience possible, please schedule your visit a minimum of seven days in advance. If you need to schedule a campus visit with less than seven days advanced notice, please call 1.800.CALL.UND (1.800.225.5863) to make arrangements.

Telephone Numbers

Call 701-777-3000 for administrative or academic office numbers. If you are calling long distance, call 1-800-CALL-UND.

Event Information

Call the Info Center at 701-777-4321, watch UND Television Cable Channel 3, stop at the Visitor Information locations listed above, consult UND’s online calendar at: und.edu, or write or call the Office of University Relations, 777-2731.

Tickets

Athletics tickets are available at the Ralph Engelstad Arena box office, hours 10 a.m. to 6 p.m., Monday-Friday and 10 a.m. to 2 p.m., Saturday (telephone 777-4689). Tickets are also available at the Chester Fritz box office, their hours are 8:30 a.m. to 4:00 p.m. Tickets for all athletic events can also be purchased by using Ticketmaster, telephone 1-800-745-3000, or at any Ticketmaster outlet; Burtness Theatre (site of Theatre Arts Department and touring productions) Box Office open approximately two weeks prior to each production, 2 to 5 p.m., Monday through Friday (telephone 777-2587 for tickets; 777-3446 for information), Chester Fritz Auditorium Box Office open from 8:30 a.m. to 4:00 p.m., Monday through Friday (telephone 777-4090 for information, 772-5151 to purchase tickets or visit any Ticket Master outlet). Alerus Center Box Office is open 10 a.m.-4 p.m., Monday-Friday, 792-1420.

Prospective Student Tours

Please schedule your campus visit online at: www.go.und.edu. To provide you with the best experience possible, please schedule your visit a minimum of seven days in advance. If you need to schedule a campus visit with less than seven days advanced notice, please call 1.800.CALL.UND (1.800.225.5863) to make arrangements.

Campus Police and Emergency Services

Call 777-3491 for UND’s 24-hour a day police desk. For all emergencies, dial 911 from both on and off campus phones. The University Police Department provides statistical information upon request in accordance with the Clery Act. This information is also available on the UND Police website: www.police.und.edu.

Dining Facilities

Parents and visitors are welcome to dine in the three dining centers with their student (guest meal prices are available or students may use their guest passes). Residence hall dining centers are in Wilkerson Hall, Squires Hall and the Memorial Union (Terrace). Convenience store service is also available in Wilkerson Hall, 3:00 p.m. to 11:00 p.m., Monday-Sunday, the Walsh Convenience store, main level of Walsh Hall, hours vary, and the U-Snack at the Memorial Union, 7:00 a.m. to 7:00 p.m., Monday-Thursday and 7:00 a.m. – 7:00 p.m., Friday. The food court at the Memorial Union, Old Main Marketplace, features A&W Express, Sbarro Pizzeria, Dakota Deli, and World Market, as well as grab n’ go options. Hours are 10:00 a.m. to 9:00 p.m., Monday–Thursday, 10:00 a.m. to 8:00 p.m., Friday, 11:00 a.m. to 8 p.m., Saturday and noon to 9 p.m., Sunday. Stomping Grounds coffee shop in the Memorial Union and University Place serve coffee, espresso, specialty coffee drinks and features fresh baked items from the UND Bakery. University Place proudly serves Starbucks coffee. The Memorial Union location hours are 7:00 a.m. to 9:00 p.m., Monday–Thursday and 7:00 a.m. – 5:00 p.m. Friday; the University Place location hours are 7:30 a.m. to 5:00 p.m. Monday-Friday and noon to 5 p.m., Saturday and Sunday.

Other eating facilities include: Wings (Airport) Café, UND Administrative Aerospace Center, Airport, 8 a.m. to 3:00 p.m., Monday - Friday, providing subs, sandwiches, hot meal entrees, and various other offerings. The food cart in the Medical School lower level offers breakfast and lunch choices, including sandwiches and beverages, 8:00 a.m. to 3:00 p.m., Monday - Friday during the academic year (hours may vary). For more information visit the Dining Services website at: http://und.edu/Student-life/dining.

Parking

Visitors are always welcome on campus. All motor vehicles parked in a designated parking area on University property must have a permit or pay the established fee as designated in one of the following locations:

1. Parking Ramp. The ramp is located at the corner of Columbia Road and 2nd Avenue North.
2. Visitor Pay Lot. The visitor lot is located at 236 Centennial Drive.
3. Metered Parking. Metered parking is available at several locations across campus.
4. Temporary Parking Pass. Purchase a temporary parking pass at Parking Services in Twamley Hall, Room 204.
Parking regulations apply to all visitors. Visitors should not park in reserved parking (permit required areas) or Service/Maintenance Vehicle areas.

For parking information, call 701-777-3551 or visit http://www.und.edu/student-life/parking/.

Books and Memorabilia
The University Bookstore, operated by Follett Higher Education Group, is located on the Bronson Property north of the main campus (725 Hamline Street).

Golf
The Ray Richards Golf Course, south of the main campus, is open to the public.

Gorecki Alumni Center
The Gorecki Alumni Center provides a welcome center for campus; an event venue for students, faculty, staff, and community; and a showcase of the University’s traditions, successes and future while celebrating our distinguished alumni and friends. It houses UND Admissions and the UND Alumni Association and Foundation. Call 701-777-4408 to schedule a tour of Gorecki, 701-777-2611 to reach the Alumni Association and Foundation, or 701-777-3000 to speak with the Office of Admissions.

Athletic Hall of Fame
The colorful and accomplished past of UND sports will be recalled by a visit to the UND Athletic Hall of Fame display area, where plaques and descriptions recognizing the more than 200 former UND athletes are included. It is located in the Ralph Engelstad Arena on the south end of the upper concourse.

North Dakota Entrepreneur Hall of Fame
North Dakota entrepreneurs and innovators are recognized for their long-standing entrepreneurial contributions to the state and nation. Located on the second level of the atrium area in the Skalicky Technology Incubator on the west end of campus, the Entrepreneur Hall of Fame includes about 70 inductees.

Performer Hall of Portraits and Posters
The large and eclectic array of internationally famous performers who have appeared in the Chester Fritz Auditorium over the years since its opening in 1972 are reflected through interesting displays of their portraits, photographed specifically for their appearance at the Auditorium. Also displayed are promotional posters, some of which are prize winners created by UND graphic designers specially for the UND shows. The dozens of portraits and posters are located in the Auditorium lobby areas.

Parking Regulations
All parking on campus is permit parking. Students who drive a vehicle on campus are encouraged to purchase a parking permit before or upon arrival.

Permits can be purchased online via Campus Connection. Temporary Parking Passes are sold online at https://apps.und.edu/payment/parking/permits/ or at Parking Services in Twamley Hall, Room 204. The navigation to purchase a student permit in Campus Connection is: Self Service>Parking Permits. If a permit is not purchased, parking is available in the Parking Ramp, Visitor Pay Lot, or metered parking at several locations across campus.

Parking regulations apply to all individuals. It is the responsibility of the individual to properly display the permit and comply with University Motor Vehicle Regulations at all times. For parking information, visit http://und.edu/finance-operations/parking-transportation/.

If you are a visitor on campus, please refer to the Visitor Information Section (http://und.edu/finance-operations/parking-transportation/parking.cfm) or visit the Parking website at http://und.edu/finance-operations/parking-transportation/parking.cfm.

Student Records
The student records maintained by the University fall into two general categories—public directory information and educational records. As the custodian of student records and in compliance with the Family Educational Rights and Privacy Act of 1974 as amended, the University assumes the trust and obligation to ensure the full protection of these student records. The University practices the policy of maintaining the confidentiality of educational records. It also guarantees that all records pertaining to a student (with the exception of those specifically exempted in the Code of Student Life) will be produced, with reasonable notice, for inspection by that individual student. The administrative procedures on student records as outlined in the Code of Student Life are adhered to by University personnel who have or accumulate educational records which are in a personally identifiable form.

Public Directory Information
Directory information, which may be released publicly in printed, electronic, or other form, is defined to include the following: name (all names on record); address (all addresses on record); e-mail address (all electronic addresses on record); phone number (all phone numbers on record); height, weight and photos of athletic team members; date of birth; place of birth; major field of study (all declared majors); minor field of study (all declared minors); class level; dates of attendance; enrollment status; names of previous institutions attended; participation in officially recognized activities and sports; honors/awards received; degree/s earned (all degrees earned); date degree earned (dates of all degrees earned); and photographic, video or electronic images of students taken and maintained by the institution.

The student may request directory information not be made public by completing an appropriate form in the Office of the Registrar. In order to effectively suppress release of directory information, students should restrict their information as early in the term as possible.

Educational Records
Educational records are those documents, records, files, and other materials which contain information directly related to a student and are maintained by the University of North Dakota or a person acting on behalf of the University. Educational records include more than academic records. Educational records, with the exception of those designated as public directory information, may not be released without written consent of the student to any individual, agency or organization other than authorized personnel. Directory Information may be released publicly in printed, electronic, or other form. See the Code of Student Life, section X, for details on the various ramifications of the Family Educational Rights and Privacy Act (FERPA), its implementing federal regulations, and UND policies. Students have a right to file a complaint regarding a violation of FERPA with the Affirmative Action Office, 101 Twamley Hall, P.O. Box 7097, Grand Forks, ND 58202-7097, or with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, D.C. 20202-5920.

Research
Research is a critical component of the mission of the University of North Dakota. As a result of research and scholarly activities conducted by faculty, undergraduate and graduate students have expanded opportunities to broaden and enrich their educational experiences. The involvement of both faculty and students in research and scholarly work enhances learning by students, keeps faculty current in their fields, and creates new knowledge that is a public good. In addition to research conducted by graduate students and postdoctoral research associates, UND has a strong record of undergraduate participation in research and scholarly work, and plans to build this participation to even greater levels.

Financial support for research and scholarly work comes from both external and internal sources. In FY2016, $118.4 million of external grants and awards was received for such activities. Internal support from various university funds amounted to $3.3 million. Internal support is provided through a number of mechanisms such as the Faculty Seed Money Program, the Senate Scholarly Activities Committee, special programs of the Division of Research & Economic Development, and by administrative units within the university. The sum of external and internal research support in FY2016 was $121.7 million. UND has received funding from the National Science Foundation through its EPS CoR
program continuously since 1986. EPSCoR is a program designed to build scientific infrastructure and research capacity in low-population states. In addition to competing successfully for NSF funds, faculty at UND have received similar infrastructure-building funding from the National Institutes of Health, the Department of Energy, the National Aeronautics and Space Administration, and other agencies.

Research and scholarly activity at UND span all of the disciplines represented at the university from anthropology and anatomy to zoology. For science and engineering, major areas of focus are energy research, biomedical research, and research related to Unmanned Aircraft Systems (or Remotely Piloted Aircraft Systems, as they are also known). In the arts and humanities, much of UND’s scholarly work focuses on our geographic location in the Northern Great Plains and on the indigenous languages, arts, cultures and histories of North Dakota. Projects in digital humanities are one way that scholarly work in arts and humanities are taking form in addition to more traditional forms of scholarship. Musical and dramatic performances and the creation of works of art are also forms of creative scholarly work. Some of UND’s major research activities are described below.

**Energy & Environmental Research Center**

The Energy & Environmental Research Center (EERC) is a unique organization dedicated to providing practical, pioneering solutions to the world’s energy and environmental challenges. It is best known for ability to bring cutting-edge science and engineering together to move technologies out of the laboratory and into the commercial marketplace. The EERC’s comprehensive research portfolio consists of a wide array of services specifically tailored to meet client needs. Since 1983, the Center has had more than 1350 clients worldwide and currently employs over 210 highly skilled scientists, engineers, and support personnel.

**College of Engineering & Mines (CEM) and the Institute for Energy Studies**

Research in the College of Engineering & Mines touches on a diverse portfolio of energy sources: petroleum, natural gas, coal, wind, and biofuels. The SUNRISE (Sustainable eNERGY Research, Infrastructure, and Supporting Education) project, which is driven by faculty in Chemical Engineering and the Department of Chemistry in the College of Arts & Sciences, has goals of advancing key areas of energy sustainability and exploring new and novel energy alternatives, while increasing the research competitiveness of the university and the development of the state. Three key areas of focus for SUNRISE are the invention, development, and commercialization of transportation fuels, chemicals, and polymers from oil seed crops; research focused on developing technologies to assist in the long-term environmentally acceptable use of coal; and wind, hydrogen, and solar energy. SUNRISE involves both undergraduate and graduate students in research.

The Institute for Energy Studies is a program in the CEM that is meant to broaden the energy research portfolio, and in particular, to emphasize multidisciplinary opportunities for education and research on energy topics, including areas such as law, business, and environmental studies.

Collaborative research between the CEM and the John D. Odegard School of Aerospace Sciences is also an important part of the CEM research enterprise. Research in the CEM focuses on sense-and-avoid devices for Unmanned Aircraft Systems (UASs) and new and lighter-weight sensor payloads for UASs.

**Weather, Climate, and Atmospheric Sciences**

Within the John D. Odegard School of Aerospace Sciences, exciting research is presently being conducted in a wide array of areas that include cloud and climate, satellite remote sensing of the atmosphere, radar meteorology, data assimilation and mesoscale modeling, and transportation weather.

The Department of Atmospheric Sciences houses the Regional Weather Information Center and the Surface Transportation Weather Research Center. Other research involves tornadoes and other severe weather systems. Multidisciplinary research on weather and climate also involves faculty from the School of Geology & Geological Engineering in the College of Engineering & Mines. The Center for Regional Climate Studies, led from the Department of Atmospheric Sciences and from Chemical Engineering, is one of two research themes (or clusters) supported in the current NSF EPSCoR grant.

**Other Physical Science Research**

Research in the physical sciences encompasses the Departments of Chemistry, Physics, Atmospheric Sciences, and the entire College of Engineering & Mines. Some areas of focus, such as nanoscience, also include interdisciplinary collaboration with the life sciences, particularly the Department of Basic Sciences and the Department of Biology. The general area of materials science is also growing within the university; this work spans topics such as better composite resins for uses in making blades for wind turbines, and extending the life of metal aircraft parts. In addition, the Department of Chemistry has a significant research focus on theoretical and computational chemistry. This expertise, together with complementary interests in the Department of Atmospheric Sciences and the Computer Science Department in the John D. Odegard School of Aerospace Sciences, has been heavily involved in High Performance Computing on this campus.

**Life Sciences**

Research in the life sciences takes place both within the School of Medicine & Health Sciences (SMHS) and in Biology and other departments in the College of Arts & Sciences. Researchers from several disciplines within the SMHS have a special focus on neuroscience, especially Parkinson’s disease and multiple sclerosis. There is also a growing program in microbiology, immunology, and infectious disease that involves collaboration with private sector life science companies in the Red River Valley. Research in Biology on parasites and vector-borne diseases, embryonic development, and genomics complements work in the medical school. Several departments are also involved in the development of a program in forensic science.

**Unmanned Aircraft Systems (UASs)**

UND has grown into a national leader for UAS research, education, and training. UND is designated as an FAA UAS Test Site for the integration of UASs into the national airspace. Since 2005, UND has collaborated with the state, other institutions of higher education, and private industry to develop commercial UAS technologies for precision agriculture, wildlife management, and emergency response, such as train derailments, car accidents, etc. UND is also a key partner for UAS companies that reside in Grand Sky, the nations only UAS business park located adjacent to the Grand Forks Air Force Base.

**Centers of Excellence and Research North Dakota Awards**

The state of North Dakota has funded several research Centers of Excellence and Research North Dakota (ND) awards that are funded in order to create collaborative research between university faculty and private sector companies in order to take the fruits of research to create new jobs and other economic impact. The Centers of Excellence and Research ND awards at UND include the following:

- Applied Research - Wind Turbine Blade Inspection Technology Application
- Center for UAS Research, Education and Training
- Center of Excellence for Gas Utilization
- Continued Development and Commercialization of Quality Characterization Technology for 3D Printing
- Cooperative Airspace Techniques and Visualization (CATV) Testing for Enabling UAS Operations
- Developing Intuitive Parking Software with FedEx using High Performance Computing
- Development of a Mobile Medical Application for the Analysis of Hand Arthritis
- Development of Remote Patient Monitoring System – VitaWIPS
- Development of Therapeutic IgY for Influenza A: Potential in Poultry, Canine and Human Markets
- Evaluation of the Effectiveness of Sports Vision Programs in Improving Performance and Health in ND Youth Athletes
- Graphene-based Nanomaterials for Biodetection and Bioimaging
The United States Department of Agriculture has its Grand Forks Human Nutrition Research Center at the edge of the UND campus. This center has a research mission focused on understanding obesity. It offers many opportunities for faculty and students to interact with federal researchers, ranging from the genomics of obesity to behavioral sciences.

**UND Tech Accelerator**

UND owns and operates the UND Tech Accelerator, a facility on the west edge of campus for research, development or manufacturing for entities such as early stage life science and advanced engineering projects companies.

The Tech Accelerator is a facility where small-tech-based companies can find office and laboratory space and assistance to grow their businesses. Some of these companies are spin-offs created as the result of UND research, and some are companies that are collaborators with UND researchers. Many also offer opportunities for students to get internships and jobs.

**Opportunities for First-Year Students**

The University of North Dakota offers a variety of high-quality experiences for first-year students that help to promote effective transition to college, engagement in the campus community, learning, and ultimately success. These experiences range from learning communities of various types, to seminars which have been specifically designed to enhance a first-year student’s academic experience at UND.

**Learning Communities at UND**

There are programs at UND that purposefully offer students the opportunity to participate in academic programs while developing lasting relationships with a small group of students and faculty. These programs afford students a relatively small “community” for pursuing their academic studies, although each community varies in its structure and methods.

The Integrated Studies Program, one of these learning communities, is a nationally-known, award-winning program. Integrated Studies (ISP) provides a unique way to take the Essential Studies classes which UND requires. Each semester of ISP includes credit from the four Essential Studies categories: Communications; Social Sciences; Arts and Humanities; and Math, Science, and Technology. To emphasize and build connections between disciplines, all class activities and discussions are organized around a central theme; class meeting time includes a variety of small group settings in which discussion among students is emphasized. For more information, refer to the Integrated Studies catalog listing, call (701) 777-3622, or visit our website at: http://und.edu/integrated-studies.

The Honors Program is a learning community designed for students with an interest in intellectual and creative pursuits. Students usually enroll in an Honors class each semester as part of their undergraduate program of study. Honors courses offer an alternative way to fulfill Essential Studies requirements. Other educational, social, and service activities extend learning beyond the classroom experience. Honors Housing allows students the option of carrying the learning community into Johnstone/Fulton Residence Halls. For information on Honors housing, contact the Housing Office at (701) 777-4251. Students in any college of the University may apply for admission to this learning community. For more information, call (701) 777-2219 or visit our website at: http://und.edu/honors-program/.

The Wellness Community focuses on living a balanced lifestyle within the college environment. As members of the Wellness floor in Brannon Hall, students have the opportunity to develop healthy practices, and incorporate the seven aspects of wellness: emotional, intellectual, physical, occupational/vocational, environmental, social and spiritual. For information on the Wellness Community, contact the Housing Office at 701-777-4251.

The Engineering Living Community is designed for new and returning students with an academic major within the College of Engineering and Mines. Members of this community combine the scholarly and social aspects of student life. The Resident Assistant (RA) on this floor is an engineering student who works to build a connective community of students with similar academic interests. Residents have tutoring in their residence hall lead by upper-class engineering students, advising sessions by faculty, and special opportunities to interact with professionals in the field. Members of this community will live on the 4th floor of McVey Hall. For additional information, contact Janet Honek at 701-777-5799 or Joel Ness, Ph.D. at 701-777-6149 in the College of Engineering and Mines.

The Aviation Community welcomes first-year students with an Aviation major in the John D. Odegard School of Aerospace Sciences Department of Aviation. Together, students who share a passion for aviation live and learn together in the Noren Hall. Students have the chance to focus on academic achievement in a productive and supportive setting and gathering for social events to meet friends and faculty. Student activities include tutoring, advising, and lunch/dinner with various department faculty and staff. For more information, contact Leslie Martin at lmartin@aero.und.edu or Elizabeth Bjerke at ebjerke@aero.und.edu.

The UND First-Year Seminar Program

Courses in the First-Year Seminar (FYS) Program aim to engage new UND students in the academic life of the university, and to empower them to succeed with their transition to college life. Grounded in the Essential Studies Program, these unique small classes enable students to discover a passion for learning, to connect with faculty and peers around academics, and to establish the foundation to become a more reflective, confident, and effective learner. FYS courses are offered on a variety of different topics and academic areas, and are listed as either UNIV 110 First Year Seminar or UNIV 115 First Year Research. More information on the types of courses being offered, as well as who to contact if you have questions, can be found on the FYS website at http://und.edu/provost/fye.cfm.

**Introduction to University Life**

UNIV 101 Introduction to University Life is a course for freshmen students, designed to enhance the transition and adjustment of first-year students attending the University of North Dakota. The intent of the course is to acquaint students with higher education and to provide specific skills that will maximize students’ opportunity for academic success. Topics include (but are not limited to): campus resources and support, university involvement, health and wellness, University information, effective communication, understanding diversity, critical thinking, and building relationships with faculty members. A common reading provides a context for academic, personal, and social investigation by students. For additional information, visit the Student Success Center website at http://und.edu/student-affairs/student-services/.

**The Honors Program**

http://und.edu/honors-program

I. General

The Honors Program serves motivated, accomplished students by nurturing creativity, critical thinking, and scholarship beyond the usual academic frameworks. Through classes, co-curricular activities, service projects, and advisement, the Honors Program creates a learning community that emphasizes intellectual exploration. Students may participate in the Honors Program throughout their undergraduate career. Students are encouraged to apply at the time of their initial registration at the University. Students may also enter the Program after the first semester, and inquiries from interested students are welcome. Please phone (701) 777-2219 or email:
honors@und.edu. Students in any college of the University may enroll in the Honors Program.

II. Administration

The Program is administered by a Director and a University Honors Committee. The Honors Program can adjust its academic program to fit the needs and goals of individual students. In response to this flexibility, Honors Program students are expected to demonstrate intellectual excellence and to pursue learning independently. Opportunities to do so are offered in Honors colloquia, other special classes, Honors sections of regular courses, and regular courses taken in Honors mode. Most students graduate from the Program as “Scholars in the Honors Program” while also fulfilling a major in one of the Colleges; however, the Honors Program also offers the option of creating an individually designed program of study through Honors. This option may result in either a B.A. or a B.S. degree earned through the College of Arts and Sciences.

III. Means

For beginning students, special introductory courses are available to familiarize students with the nature of the Program and to acquaint Honors students with faculty. Advanced courses and colloquia introduce students to the full range of the disciplines which make up the University.

The requirements to graduate as a Scholar in the Honors Program are:

1. a minimum of 24 credits in Honors work including 8 credits of colloquia;
2. a Sophomore Honors Portfolio accepted by the Honors Committee; and
3. a senior thesis and oral presentation (with a grade no lower than “B”) in a chosen field.

After successful completion of 9 Honors credit hours and submission of the Sophomore Honors Portfolio, the student will be considered for full membership in the Honors Program. Completion of all Honors requirements, including the senior thesis, fulfills the University’s Essential Studies Requirements. To graduate with an Honors major alone, students are additionally required to develop, in conjunction with an Honors advisor, an academic program based around individual needs. This program of study must be approved by the Honors Program. The colloquia mentioned above are topical and, usually, interdisciplinary discussion courses, one semester in length, on topics chosen according to student and faculty interests. The Honors mode entails an extra credit of work in a regular course so a greater than usual depth and/or breadth of knowledge can be achieved in that course.

In addition, Honors Program students are expected to maintain a solid academic performance. A student should attain a 3.2 grade point average by the sophomore year and maintain it. If this does not occur, the Honors Committee reviews the standing of the student.

IV. Advantages

Students in the Honors Program have many opportunities to develop their own ideas and their writing and research skills; they also benefit from close association with faculty and other students who share their intellectual interests. Honors Program courses encourage students to think independently, creatively, and critically; to express their thoughts clearly, orally and in writing; to expand their perspectives on the world; to develop as citizens; to understand the nature of scholarly inquiry; and to forge connections among disciplines. Successful completion of the Program is a clear signal to prospective employers and to future graduate studies.

The Program is administered by a Director and a University Honors Committee. The Honors Program can adjust its academic program to fit the needs and goals of individual students. In response to this flexibility, Honors Program students are expected to demonstrate intellectual excellence and to pursue learning independently. Opportunities to do so are offered in Honors colloquia, other special classes, Honors sections of regular courses, and regular courses taken in Honors mode. Most students graduate from the Program as “Scholars in the Honors Program” while also fulfilling a major in one of the Colleges; however, the Honors Program also offers the option of creating an individually designed program of study through Honors. This option may result in either a B.A. or a B.S. degree earned through the College of Arts and Sciences.

The Senior Honors Thesis

http://und.edu/honors-program/

Through the Senior Honors Thesis (including Departmental theses), students of marked ability may pursue, in their senior year, a voluntary program of supervised independent study, leading to the bachelor’s degree with honors in the major field of study. The purpose of this program is twofold: first, to give public recognition to the superior student; and second, to enable the student to broaden, deepen, and enrich the educational experience.

In order to be eligible, a student must have completed 75 credit hours by the end of the first semester of the junior year with a general grade point average of at least 3.2. Students must apply for admission to pursue honors work by April 1 of their junior year. If he or she is certified by the chairperson of his or her major department, Academic Dean, and the Honors Committee, the student and his or her supervisor will then plan a course of independent study for the following year.

The credits in independent study shall total nine credits. At the discretion of the department and of the Honors Committee, these credits may be either in addition to major requirements or in place of some requirements. Such a study may consist of Honors Program courses, laboratory research, seminars, creative work, or any combination of these which the department and the Committee may approve. This study, whatever its nature may be, will appear on the student’s record with the number 489 and the title “Senior Honors Thesis.” The study may be either departmental or interdepartmental. To qualify for Senior Honors, the student must receive a grade no lower than a “B” for this work. Theses will be bound and deposited in the University Library. The student will be expected to meet the nominal charge involved.

The student must maintain a GPA of at least 3.2, make satisfactory progress in his or her course of independent study, and submit a progress report to the supervisor at the end of the first semester of the senior year. At that time, the student, the department, or the Committee may decide to terminate the student’s honors work. At or near the end of the senior year, if the work is continued, the student will participate in the Honors Undergraduate Research Conference or take a comprehensive oral examination at which a member of the Honors Committee shall be present.

An unsuccessful candidate for Senior Honors will receive the bachelor’s degree with the usual General Honors if his or her record meets the grade-point requirements. A successful candidate for Senior (Departmental) Honors will receive the same distinction; the additional notation “Departmental Honors” will appear on the Commencement program and transcript.

Tuition, Fees, Financial Information

- Tuition, Fees, Financial Information (p. 15)
- Contiguous States/Provinces, Western Undergraduate Exchange Program (p. 17)
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Tuition and Fees

Tuition and Fees, as of Spring 2017*
(Per semester, 12 or more credits)*

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Minnesota</th>
<th>Contiguous</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>$4,068.50</td>
<td>$4,469</td>
<td>$5,738</td>
<td>$9,645.50</td>
</tr>
<tr>
<td>Graduate</td>
<td>$4,321.50</td>
<td>$5,291.50</td>
<td>$6,117.50</td>
<td>$10,321</td>
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<tr>
<td>Law</td>
<td>$330.94</td>
<td>$466.04</td>
<td>$466.04</td>
<td>$782.21</td>
</tr>
<tr>
<td>Medicine</td>
<td>$15,119.50</td>
<td>$16,558</td>
<td>$27,365</td>
<td>$27,365</td>
</tr>
</tbody>
</table>

* http://und.edu/honors-program/
How a change to a student’s major can increase the amount owed:

1. If the department approves a change of the student’s major effective immediately (current semester), additional fees may be incurred by the student.
2. If the department approves a change of the student’s major effective the following semester, no additional charges would be incurred for the current semester.

Estimated Yearly Expenses

The following table gives an estimate of the expenses of a single, undergraduate student residing on campus during the nine month, 2016-2017 college year. Detailed information about the cost of attending the University is available from the Office of Enrollment Services.

<table>
<thead>
<tr>
<th></th>
<th>North Dakota</th>
<th>Minnesota</th>
<th>Contiguous &amp; WUE States</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees</td>
<td>$8,137</td>
<td>$8,938</td>
<td>$11,476</td>
<td>$19,291</td>
</tr>
<tr>
<td>Room and Board</td>
<td>$7,689</td>
<td>$7,689</td>
<td>$7,689</td>
<td>$7,689</td>
</tr>
<tr>
<td>Books and Supplies</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Personal Expenses</td>
<td>$3,400</td>
<td>$3,400</td>
<td>$3,400</td>
<td>$3,400</td>
</tr>
<tr>
<td>Total Est. Costs</td>
<td>$20,226</td>
<td>$21,027</td>
<td>$23,565</td>
<td>$31,380</td>
</tr>
</tbody>
</table>

* Costs based on UND residence hall rates (double room and unlimited access meal contract) and includes the Association of Residence Halls fee.

Regulations Regarding Non-Resident Fees

Tuition for Non-Resident Students: (Requirements subject to change without notice. Please visit Student Account Services’ website at: http://und.edu/finance-operations/student-account-services/index.cfm for the most current information.) Non-resident students seeking to declare North Dakota residence for tuition purposes must submit an affidavit of residency online to Student Account Services for the term in which they are currently enrolled within 30 days from the first day of regular term classes. For purposes of determining residency, a resident student is defined by law as follows:

1. A person whose custodial parent, guardian, or parents have been a legal resident of North Dakota for twelve months or a dependent child whose custodial parent moved into the state with the intent to establish legal residency for a period of years within the last twelve months immediately prior to the beginning of the academic term;
2. A person eighteen years of age or older who has been a legal resident of North Dakota for twelve months immediately prior to the beginning of the academic term;
3. A person who graduated from a North Dakota high school;
4. A full-time active duty member of the armed forces, a member of a North Dakota national guard unit, a member of the armed forces reserve component stationed in North Dakota, or a veteran as defined in NDCC section 37-01-40;
5. A spouse or a dependent of a full-time active duty member of the armed forces, a member of a North Dakota national guard unit, a member of the armed forces reserve component stationed in North Dakota, or a veteran as defined in NDCC section 37-01-40, provided the veteran is able to transfer entitlement under the Post 9-11 Veterans Educational Assistance Act of 2008 [38 U.S.C. 3301];
6. A benefited employee of the North Dakota university system;
7. A spouse* or dependent** of a benefited employee of the North Dakota university system;
8. The spouse of any other person who is a resident for tuition purposes;
9. Any other person who was a legal resident of this state for at least three consecutive years within six years prior to the beginning of the academic term; or
10. A child, stepchild, widow, or widower of a veteran as defined in NDCC section 37-01-40 who was killed in action or died from wounds or other service-connected causes, was totally disabled as a result of service-connected cause, died from service-connected disabilities, was a prisoner of war, or was declared missing in action.

* "Spouse" means both parties to a marriage recognized by the state of North Dakota including those subject to an order of legal separation, but not divorced persons.

** "Dependent" means only a person claimed as a dependent on the most recent federal tax return.

Electronic applications for residency are available online at: http://www.und.edu/finance-operations/student-account-services/residency.cfm.

**Legality residence in the State of North Dakota includes, but is not necessarily limited to the following responsibilities and rights:**

1. To vote in general or special elections in the State.
2. To obtain a North Dakota driver’s license.
3. To obtain a North Dakota license for any motor vehicle owned.
4. To file a North Dakota resident income tax return.
5. To obtain a ND resident game or fishing license after 6 months residency in the state.

**International Students:** To qualify as a North Dakota resident for tuition purposes, international students who are not refugees must have an Alien Registration Receipt Card (Green Card) proving permanent residency or immigrant status and must meet all the other North Dakota residency requirements for tuition purposes. Refugee students should contact Student Account Services for requirements.

**Minnesota Tuition Reciprocity**

Residents of Minnesota and their dependents may attend a North Dakota state institution of higher learning and pay a special tuition rate that is lower than the normal non-resident rate. (Minnesota reciprocity tuition rates are not available to Medical and Law students.)

To be certified for reciprocity at UND, Minnesota students must do two things:

1. File UND’s standard admission application; and
2. File a reciprocity participation application with Minnesota at their website: www.ohe.state.mn.us (http://www.ohe.state.mn.us).

Instructions to apply for MN Reciprocity:

1. Go to the Reciprocity website at www.ohe.state.mn.us (http://www.ohe.state.mn.us)
2. Click on Online Applications under Paying for College
3. Click on Tuition Reciprocity
4. This will bring you to an informational page. About halfway down the page, you will see the semester dates that are available to apply for Reciprocity. It is critical that you choose the correct semester; please review your options carefully.
5. After choosing your option, scroll down to the bottom of the page, click “Yes/No,” and you will be directed to the site for the simple reciprocity test.
6. Take the test and print off a copy of the “Congratulations” letter for your records.
7. Notify One Stop Student Services of your approval by completing the MN Reciprocity Request form at https://apps.und.edu/forms/index.cfm? or call One Stop Student Services at 701-777-1234 to let us know that you have applied and been approved.

8. Students who previously participated in the reciprocity program and have had a break in their enrollment of one semester or more, must re-apply for reciprocity.

Applications must be submitted within the established due date provided on the One Stop Student Services website located at: http://und.edu/finance-operations/student-account-services/residency.cfm.

**Please Note:**

1. A student who has graduated from a Minnesota High School within the 12 month period prior to first term of enrollment will not be required to complete a reciprocity participation application.
2. A student who was enrolled, received reciprocity, and earned credits during any term of the academic year will automatically have benefits renewed for the following academic year at the same institution.
3. Any student who is enrolling and has taken a break in semesters or is a transfer student, must complete a new reciprocity participation application.
4. Students who previously participated in the reciprocity program and have had a break in enrollment at UND of one semester or more, must re-apply for reciprocity.

Until Reciprocity is granted, students are required to pay non-resident tuition. The Minnesota Reciprocity tuition rate is granted only for the current term and concurrent future terms as approved on www.ohe.state.mn.us (http://www.ohe.state.mn.us). If you apply for Minnesota Reciprocity during any term, and your approval also states that you are approved for the previous term(s), UND will not go back and change those previous term tuition rates. Adjustments in tuition rates will only be made for the current term; previous terms are adjusted based on a case to case basis where special circumstances exist that warrant an exception to policy. All previous term tuition rate changes must be approved by UND Administration. To be considered for a past semester tuition rate adjustment, a Campus Connection Charge Appeal form must be completed. The form can be accessed using your Campus Connection ID and Password here: apps.UND.edu/studentforms/index.cfm (https://apps.und.edu/studentforms).

Student Account Services recommends that each student verifies his/her tuition rate at the beginning of each term so that any corrections can be made promptly.

*Any exceptions will be approached on a case by case basis.

**Contiguous States/Provinces, Western Undergraduate Exchange Program**

Rates for these student exchange programs are determined at the time of admission and are based on information provided on the admission application. For more detailed information on these tuition rates, please visit: http://und.edu/finance-operations/student-account-services/tuition-rates.cfm

**Midwest Student Exchange Program States (MSEP)**

Minnesota, Indiana, Illinois, Michigan, Missouri, Nebraska, Kansas, and Wisconsin

**Contiguous States/Provinces**

South Dakota, Montana, Saskatchewan, and Manitoba

**Western Undergraduate Exchange States (WUE)**


- Tuition rate adjustments will only apply to the current term. Prior terms will not be adjusted.
Dependents and Spouses of North Dakota University System Graduates

Dependents and spouses of North Dakota University System campus graduates may be eligible for a lower tuition and fee rate than other nonresidents. If qualified, students may attend a North Dakota University System institution at a tuition rate of 150% of the resident tuition rate plus all applicable fees. This program applies to all qualified students who are newly enrolled for the Fall 1999 term or later. This category is for undergraduate instruction only.

Refunds

Refund of Institutional Charges for Withdrawn Students

Student Withdrawal/Cancellation (dropping to zero credits) must adhere to the established refund dates in order to receive a full or partial refund. Students CANNOT withdraw on Campus Connection. Any student leaving UND must complete the official withdrawal/cancellation form, located on the Registrar’s website at: UND.edu/academics/registrar/forms.cfm (http://und.edu/academics/registrar/forms.cfm)

1. A student who withdraws from the University under normal conditions and after the beginning of instruction will be granted a refund of tuition/fees in accordance with federal regulations and North Dakota State Board of Higher Education policy 830.2.

2. Institutional charges shall be refunded according to a schedule approved by the Chancellor that provides for a percentage refund, which approximates the amount the institution must return to the Title IV financial aid programs.

3. A student must withdraw officially from the University within the stated refund period to be eligible for a refund of tuition and fees. No refund will be made to a student who is suspended, dismissed, or expelled for breach of discipline. Please visit this link for more detailed information: http://und.edu/one-stop/.

4. Any student who has an approved rescind (Room and Board Contract Cancellation) shall receive a refund for his/her room and board in accordance with the State Board of Higher Education refund policy.

5. A student may appeal the refund percentage by submitting a Campus Connection Charges Appeal form to Student Account Services in accordance with appeal process outlined in State Board policy 830.2 (#5).

Refunds for Dropped Classes

Students dropping courses must adhere to the refund date specifically set for dropping courses. All dropped courses are completed by the student in Campus Connection. There are no partial refunds for classes dropped after the deadline for a refund. A student cannot drop to zero credits in Campus Connection.

Any student that drops a class within the first 9% of the enrollment period for that class shall receive a 100% refund for the credit hours attributable to the class. After 9% of the enrollment period for a class is completed, no refund shall be made for a class which is dropped, i.e., if a student adds a course to their schedule after the last day to drop, they will not be able to drop the course and get a refund. However, classes of the same number of credits, within the same semester, may be substituted for the dropped class at no additional tuition and fee charge, unless the added class requires a special fee or change in tuition. Correspondence, online, and collaborative courses are not eligible for exchange. The refund dates for dropped courses can be located on the One Stop Student Service’s web page: http://und.edu/one-stop/.

Example of potential negative financial impact from not knowing the difference between dropping and withdrawing:

November 30, 2016: Student enrolls in 12 credits at a cost of $3,627.04.
January 23, 2017: Last Day to Drop with a Refund or Withdraw for a 100% Refund.
January 26, 2017: Student decides that they want to leave UND and drops all (9 credits) but one course on Campus Connection. (Campus Connection will not allow a student to drop all courses online.)
February 1, 2017: Student receives 0% refund on dropped courses.
Still owes $3,627.04
February 3, 2017: Student completes withdrawal form. Receives 75% refund for 3 remaining credits. $680.04

If student would not have dropped any courses on Campus Connection and completed a proper withdrawal for their 12 credits, they would have received a 75% refund on all credits = $2,720.16 for a difference of $,2040.12!

For refund deadlines, please go to: http://und.edu/one-stop/
Contact One Stop Student Services to determine the potential financial impacts of course changes or withdrawal from UND: 701.777.1234; onestop@UND.edu (SAS@UND.edu); Memorial Union, Room 106.

Other Fees

Credit Balance Refunds

Students that withdraw or drop credits within the specified dates and deadlines to receive a refund will be issued their credit balance through the BankMobile. For more information on UND refund choices, please visit: https://und.edu/admissions/student-account-services/refund-choice-card.cfm

Students in Debt to the University

A student who is in debt to the University will not be permitted to enroll in classes at the University and will not be entitled to receive a transcript of credits or a diploma until the indebtedness has been paid in full.

Satisfactory Progress

Any time you drop a course or withdraw from the University, you may be jeopardizing your federally-funded student financial aid, now or in the future. You must successfully complete at least two-thirds of all courses in which you enroll. Dropping after the first day of class may not affect your academic standing, but it may affect your ability to receive financial aid.

Why does UND have Satisfactory Academic Progress (SAP)?

1. The Department of Education has regulated that every school who awards Title IV funding must have a Satisfactory Academic Progress policy to ensure students are progressing with their academics.

2. The Student Financial Aid Office runs the SAP process after grades are posted every semester. Students have their GPA, credit completion rate and total attempted credits evaluated.

   • GPA
     Undergraduate and Law students must have a 2.0 cumulative GPA.
     Graduate students must have a 3.0 cumulative GPA.

   • Completion Rate
     All students must complete 66.667% of the credits they attempt.
All credits enrolled in as of the financial aid census date for the semester count as attempted.

A course is not completed successfully if it is failed, incomplete, or withdrawn.

• Maximum Time Frame
  Undergraduate students must complete their degree within 187 attempted credits.
  Graduate and Law students must complete their degree within 135 attempted credits.
  Medical students must complete their degree within 218 attempted credits.

All credits enrolled in as of the financial aid census date for the semester count as attempted.

What is the academic advisor’s roll with SAP petition process?

• Depending on the student’s situation. The SFA Office needs to know that the student has been advised about the requirements for their degree, received guidance on a course load they can successfully complete to which they are able to progress to graduation.

Student Financial Aid

Financial aid is available to students who, without such help, would be unable to attend the University of North Dakota.

The primary responsibility for financing a college education rests with the student and family. UND financial aid is viewed as a supplement to family support.

Most student aid is awarded on the basis of need. “Need” is the difference between cost of education (tuition, fees, room, board, books, supplies and related educational expenses) and the Expected Family Contribution, which is the amount the student and family is expected to contribute, as determined by a standard formula. In determining family contribution, four major sources are considered:

1. family income,
2. family assets,
3. student’s income, and
4. student’s assets.

If cost exceeds the family contribution, need will exist; and every effort will be made to provide adequate financial aid. To offer maximum assistance, awards often are made in the form of a financial aid “package” combining one or more different types of aid (loans, scholarships, grants, or employment).

The final determination regarding the type(s) and amount of aid awarded is based upon an evaluation of the applicant’s eligibility for a particular type of aid and upon the availability of funds under the various aid programs.

Types of Aid

Four different types of financial aid are offered:

1. employment,
2. loans,
3. scholarships, and
4. grants.

Employment enables recipients to work and earn money. Loans are borrowed money which must be repaid with interest. Scholarships are gifts awarded on the basis of academic performance and potential. Grants are gifts of money which do not have to be repaid.

Financial Aid Procedures and Award Policies

February 1 is the priority deadline at the University of North Dakota. To receive top consideration for all programs, students are advised to complete the FAFSA by February 1. Students must submit the FAFSA or Renewal FAFSA each year.

The Student Financial Aid Office awards aid to the neediest students who have a complete file by February 1. After that date, students’ files are considered by the date the FAFSA was received for processing until all funds are awarded. Late applicants, as well as those who incorrectly fill out their application materials, may experience a considerable delay in receiving notification of their eligibility and subsequent delivery of any remaining financial aid funds.

All students whose files are complete will be notified by early summer regarding the action taken on their application. Recipients of financial aid must accept or reject the aid within 30 days after receiving notice of the award or one week prior to the semester ending, which ever comes first.

Coursework that does not count toward the graduation requirements at UND, i.e., all audited coursework, also does not count toward enrollment requirements for financial aid eligibility.

Verification

The Department of Education or UND may ask students to prove the information they provided on their applications for financial aid is accurate. As part of this process, students and/or parent(s) will be required to complete the IRS Data Retrieval within the FAFSA application. The student and/or parent(s) may be asked to provide additional information or documentation based on why the file was selected for verification. Failure to provide proof may result in the cancellation of aid from all of the Title IV programs and may also result in the cancellation of aid from other sources.

Federal financial aid received because a student reported incorrect information will have to be repaid. Any person who intentionally makes false statements or misrepresentations on a Federal financial aid application is violating the law and is subject to a fine or imprisonment or both, under provisions of the U.S. Criminal Code.

Satisfactory Academic Progress for Financial Aid Eligibility

To be eligible to receive financial aid, students must meet the following minimum standards as established by the University:

Academic Standard:

1. Undergraduate Students
   a. All students must have a minimum cumulative grade point average of 2.00. All other undergraduate students who meet the University’s minimum academic standards as defined in the UND Undergraduate Catalog meet this standard.

2. Graduate Students
   a. Graduate students must have a minimum 3.0 institutional cumulative grade point average.

3. All students must be eligible to re-enroll in the next term in order to meet this standard. The student’s cumulative grade point average will be reviewed at the end of each regular period of enrollment.

Rate of Progress Standards:

1. Maximum Time Frame
   a. Undergraduate Students
      Undergraduate students shall be making satisfactory progress for financial aid purposes if their program of study is completed within 150% of the length of the program (a maximum of 187 attempted credits for all programs).
      Post-baccalaureate students (not admitted to graduate, law, or medical programs of study) enrolled in an educational program that leads to an undergraduate degree or teacher certification are also subject to the undergraduate maximum time frame standard.
   b. Graduate Students
      Students admitted to the School of Graduate Studies shall be making satisfactory progress for financial aid purposes if their program of study is completed within a maximum of 135 attempted credits.
Information concerning Head Resident, Resident Assistant, Cooperative Education Program, and/or departmental internships is available by contacting individual departments responsible for selection.

Loans

Student loan funds can be categorized into two classifications: long and short term loans. Long term loans are generally low-interest loans administered by the federal Department of Education. Interest rates, eligibility, repayment terms, deferment, and cancellation provisions vary with the specific loan program. Some of the federal loan programs in which the University of North Dakota participates are: Perkins Loan, Direct Loan, PLUS, Grad PLUS, Nursing Student Loan, Primary Care Loan. Canadian Higher Education Loan Program (CanHELP) and private educational loans are also available at UND. Many of the private education loan programs are available to students who are not degree-seeking or are enrolled less than half-time. A more complete listing of private education loans is available at: und.edu/financial-aid.

Federal requirements require all first time borrowers at UND to attend an Entrance Loan Counseling session prior to receiving loan funds. Exit Loan Counseling is also required at the time a student graduates or drops below half-time enrollment at the University. These requirements must be completed on the internet at: und.edu/financial-aid.

The short-term emergency educational loan program derives its funds from different sources provided primarily by private donations. Short-term loans are to be paid back within 30 days or the end of the semester, whichever comes first. Students are limited to one short-term loan at a time. The availability of these loans may be restricted based on the amount of funds remaining.

Scholarships

The scholarship program at the University of North Dakota is one of the best at public institutions of its size. Scholarships are supported by gifts from UND alumni and friends.

Because high educational quality comes less expensively at UND than at most other academic institutions, scholarships can significantly help students in their financial preparation for college.

Past academic excellence and the expectation of continued achievement determine the recipients of more than 4,400 undergraduate scholarships totaling over $8.40 million per year. These vary in amounts up to $5,000 per academic year.

Each of the awards is based upon a number of variable factors stipulated by the donors. UND awards scholarships to the most worthy, promising applicants who meet the qualifications of the particular scholarship. Most of the undergraduate scholarships are awarded on the basis of past academic performance.

Scholarships to entering freshmen are usually limited to students who have exceptional ACT or SAT scores and who have a high school grade point average (GPA) or GED score commensurate with their ACT or SAT score. Transfer students and returning UND undergraduate students receiving 4.0 (straight A) averages are awarded scholarships first, and the rest of the scholarships are awarded to students with the next lower grade point average until all of the money is exhausted.

New students are considered for undergraduate scholarships at the time of admission to UND. Visit und.edu/financial-aid for more details. Current students should complete the Returning Student Scholarship Application form which is available at: und.edu/financial-aid.

Cultural Diversity Tuition Waivers

UND awards several tuition waivers to broaden the cultural diversity on campus. Cultural diversity, for this waiver, is defined as individuals who come from historically under-represented groups (African American, American Indian, Asian American, Hispanic American, and the economically disadvantaged). Application information is available at: und.edu/financial-aid. The priority date for top consideration is April 15.
Grants

The largest of the grant programs, the Federal Pell Grant entitlement program, provides grants to those students who meet the eligibility and need criteria established by Federal regulations. For the 2015-2016 school year, grants range from $581 to $5,775. The exact amount of a Pell Grant depends upon the student’s need and the money appropriated by Congress to fund the program in any given year. Students can receive this grant for the period required for completion of the first undergraduate baccalaureate degree.

Supplemental Educational Opportunity Grants (SEOG) are available to undergraduate students who qualify for the Pell Grant and meet the priority date of April 15. Eligible students enrolled at least half-time (6 credits) may receive grants up to $400 per year.

The Teacher Education Assistance for College and Higher Education (TEACH) Grant Loan Program provides up to $4,000 per year in grants to undergraduate and graduate students who intend to teach full-time in high-need subject areas for at least four years at schools that serve students from low-income families. Students can receive up to $4,000 per year and the grant is available to students who are enrolled less than half-time. Students who fail to complete the 4-year teaching obligation within 8 years of completing or ceasing their program of study will have to repay the grant with interest (it will become a Federal Direct Unsubsidized Loan). More information on the application and eligibility requirements for this program are available at: und.edu/financial-aid.

The North Dakota Student Financial Assistance Program provides non-repayable grants to North Dakota residents to aid undergraduate students in need of financial assistance. The Free Application For Federal Student Aid (FAFSA) serves as the application for the State Grant Program. To ensure that your FAFSA will be received by the State Grant Program and be considered as an application for the Program, you must list at least one eligible North Dakota college code on the FAFSA. The deadline for priority consideration is April 15. For 2015-2016, students awarded a Student Financial Assistance Grant will receive $1,650 for the academic year. Additional information may be obtained from:

The Student Financial Assistance Program
North Dakota University System
600 E. Boulevard
Bismarck, ND 58505

Other Sources of Aid

The United States Army and U.S. Air Force provide scholarships to students pursuing studies in the Army ROTC program. Four year scholarships are offered on a competitive basis to outstanding students entering college for the first time. ROTC also offers two and three year scholarships to students who have successfully completed one or two years of college and have been selected as the most qualified applicants for the available awards. Enrollment in ROTC is not a prerequisite to applying for a two or three year scholarship. For information, contact the Military Science Department.

American Indian students should contact their local tribal agency concerning their eligibility for BIA/Tribal Scholarship funds. The awarding of BIA/Tribal Scholarships will be dependent upon the availability of funds.

Any active member of the North Dakota National Guard presently serving in either the Army Guard or the Air Guard may receive a partial tuition reimbursement. Loan repayment assistance is also available. For information on eligibility requirements, contact your local National Guard unit or the Office of the Adjutant General, PO Box 551, Bismarck, ND 58502-5511 or (701) 224-5110.

Veterans may be able to receive special educational assistance. Benefits have also been extended to children, wives and widows of deceased or permanently and totally disabled veterans. The Veteran Services officer on campus can assist in any VA related questions or problems. Applications and more information can also be obtained from any Veterans Administration Regional Office.

Students with a physical limitation or health problem may be entitled to certain benefits such as tuition, fees and textbooks reimbursement. Interested students should communicate with the Division of Vocational Rehabilitation at the nearest district or regional office.

There are many outside agencies and sources which offer financial assistance to students. They are so numerous it is impossible to list them all. However, most libraries have available various types of resource materials in order to review the various sources of aid.

Student Services, Support Programs and Activities

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- Academic Support (p. 22)
- Admissions, Office of (p. 22)
- American Indian Student Services (p. 22)
- Art Museum (p. 22)
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- Center for Instructional & Learning Technologies (CILT) (p. 22)
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- Health and Wellness Hub (p. 25)
- Health Service (p. 25)
- Honor Societies (p. 25)
- Housing and Dining (p. 26)
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- Information Technology (p. 27)
- Instructional Development, Office of (p. 27)
- Intercollegiate Athletics (p. 27)
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- Libraries (p. 28)
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- Multicultural Student Services (p. 28)
- Museum of Art, North Dakota (p. 28)
- One-Stop Student Services (p. 28)
- Radio, UND (p. 28)
- RecSports (p. 29)
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- Religious Activities (p. 29)
- Research Development and Compliance (p. 29)
- Speech, Language and Hearing Clinic (p. 29)
- Student Affairs, Division of (p. 29)
- Student Financial Aid Office (p. 29)
- Student Health Services (p. 30)
- Student Rights and Responsibilities, Office of (p. 24)
- Study Abroad Office (p. 30)
- Telecommunications (p. 30)
The American Indian Student Services (AISS) is designed to promote and foster the academic and personal success of American Indian and other underrepresented students to monitor their academic progress, give guidance and direction, provide tutoring, etc. The program was created to support, guide, and encourage American Indian students to successfully achieve academic goals, foster career goals, develop personal life skills, and attain leadership skills.

The student academic services component strives to meet the scholarly needs of American Indian students. Students are encouraged to utilize the AISS tutoring program. AISS tutors are available Sunday through Thursday evenings in various subject areas such as math, science, business, and college level writing. AISS also sponsors study skills, time and money management, and writing workshops in addition to a wide range of tutor learning activities. A computer lab with printing is available for student use.

The American Indian Center serves as an academic and social gathering area for American Indian and other students, while providing the students “a home away from home.” American Indian student organizations and programs, faculty, and staff host a variety of cultural activities, meetings, academic enhancement workshops, etc., at the Center. All UND students are welcome and encouraged to utilize the American Indian Center and AISS services where we are working “to build stronger American Indian communities, one successful student at a time”!

American Indian Student Services
315 Princeton Street
Phone (701) 777-4291

The AISS Student Success Program is a student success program designed for American Indian and other underrepresented students to monitor their academic progress, give guidance and direction, provide tutoring, etc. The program was created to support, guide, and encourage American Indian students to successfully achieve academic goals, foster career goals, develop personal life skills, and attain leadership skills.

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Academic Support
McCannel Hall, Room 180
Phone (701) 777-3398, FAX (701) 777-3397
http://und.edu/student-affairs/academic-support/

Services and instruction are provided to assist students in successful academic achievement. These services include: drop-in tutoring and individual support for students with academic concerns.

Drop-in tutoring, available to all UND students, is based on student demand and includes many 100 and 200 level courses, such as accounting, economics, foreign languages, mathematics, biology, chemistry, and physics. The Tutor Lab is in McCannel Hall, Room 180. A complete listing of subjects and times for drop-in tutoring may be found at: http://und.edu/student-affairs/academic-support/drop-in-tutor.cfm

Individual assistance and assessment for students with academic concerns such as test-taking strategies, learning styles, study skills, and time management issues are offered through Academic Support.

Admissions, Office of
Gorecki Alumni Center
3501 University Avenue
Phone (701) 777-3000
(701) 777-0424 TTY Service Only

The Office of Admissions is the central contact point for dissemination of enrollment information about the University of North Dakota. The primary mission of Admissions is to inform and assist prospective students regarding admission, housing, academic programs and campus procedures. The office provides tours of campus as well as sends general information for the University. Additional information about visiting campus may be found in the Visitor Information (p. 11) and Campus Visits (http://und.edu/discover/visit.cfm) sections.

American Indian Student Services
315 Princeton Street
Phone (701) 777-4291

American Indian Student Services (AISS) is designed to promote and foster the academic and personal success of American Indian and other students enrolled at the University of North Dakota (UND). AISS works directly with the UND Admissions Office to actively recruit American Indian high school and community college students, and collaborates with other departments and external agencies to provide the highest quality of services and advocacy. AISS introduces new students to UND and supports continuing students by serving as an information, assistance, and resource center.

Services are provided to guide and support students in their transition to the University through to graduation/degree(s) attainment. The student support component provides academic, personal, and cultural advisement and support. AISS also assists new and transfer students with University orientation, the early registration process, academic advisement, financial aid and scholarship information, general information, and referral resources.

Art Museum
(see North Dakota Museum of Art (p. 28))

Athletics
(see Intercollegiate Athletics (p. 27))

Auditorium
(see Chester Fritz Auditorium (p. 23))

Career Services
280 McCannel Hall
Phone (701) 777-3904
www.und.edu/careerservices

Career Services’ goal is to guide students in planning for and carrying out their career goals and providing students with opportunities to apply the learning environment beyond the classroom through employer partnerships. This is accomplished through individual and/or group assistance in job search techniques, resume/cover letter writing and interviewing skills. Career Services works with employers and academic departments to provide opportunities for students to combine coursework with practical, professional employment in their chosen fields.

The Career Services office coordinates activities such as on-campus interviews, provides specialized workshops, and holds seven Career Fairs annually.

Students from all disciplines are encouraged to register on Career Connect, the portal within the Career Services website. Registration is done online via the Career Services homepage. Once registered, students have access to job and internship opportunities, become available to employers who search the data base, and are able to schedule campus interviews and gain information about Career Services events.

The Student Employment office is also located at Career Services. Students seeking on-campus, off-campus and Work Study employment receive assistance with their job search from a Student Employment Coordinator.

Center for Instructional & Learning Technologies (CILT)
Main Office: 701-777-2129
Tech Support 707-777-6305
http://UND.edu/CILT

The mission of the Center for Instructional & Learning Technologies (CILT) is to collaborate with the University community to provide support for faculty, students, and staff in the pursuit of innovation and excellence in teaching and learning. CILT models a support environment where innovation is encouraged to discover and explore new ideas, acquire new skills and develop materials to enrich instruction. Service and support areas include: Instructional Design, Learning Management System (Blackboard), Training & Development (workshops, forums and seminars), Tech Support (desktop, instructional/ application, helpdesk and service desk), Classroom Services (equipment, classroom design and support), and Collaboration Services (web/video conferencing and multimedia production). Contact and more information can be found at: http://UND.edu/CILT

Ceremonies and University Events, Office of

407 Twamley Hall
Phone (701) 777-2731

The Office of Ceremonies and University Events is responsible for the planning and coordination of Commencement ceremonies and a select slate of official events of the University of North Dakota. In addition to UND’s Commencement ceremonies, these special events include Founders Day, the Statewide Bus Tour for New Faculty and Administrators, Student Graduation Expos, and groundbreaking and dedications of campus buildings. The Office also provides leadership for planning activities held to celebrate special UND milestones and traditions. The Office coordinates special projects as requested by the President or Vice President for University and Public Affairs. The staff of the Office of Ceremonies and University Events is available to serve in a consulting role to UND units upon request.

Chester Fritz Auditorium

Phone (701) 777-3076

The 2,400-seat Chester Fritz Auditorium is used for a variety of events. It is the site for graduations, symphony concerts, lectures, workshops, Broadway shows, and concerts by major stars.

The auditorium, an integral part of the University intellectual and social environment, has a three-fold mission:
1. As a cultural and educational resource for the University and community;
2. For general entertainment, ranging from contemporary performers, the art of dance, and the literature of theatre; and
3. As a public facility to be used by both University and non-university programming groups.

Chief Information Officer, Office of

Phone 701.777.4273
http://cio.und.edu

UND’s use of information technology (IT) is dynamic, pervasive, and is provided for all campus members; students, faculty and staff. Services include; Enterprise Services – Application Administration, Programming, and Web Development, Integrated Services, Technical Services – Database Development, Network Services, Production Control/Operators, and Server Administration, and Telecommunications. These service areas provide high quality, reliable and timely services for unified communications, web content management system, security, wireless and wired network, server administration and data storage. In collaboration with the office of the Vice President for Research, staff provide cyber infrastructure — high performance computing, related storage, visualization facilities and necessary support and consulting.

Telecommunications (www.telecom.und.edu/) in Carnegie Hall provides telephone services and support of the campus cable plant to the university community. Telephone services include: dial tone, telephone repair service, long distance, voicemail, cellular phones (faculty and staff), video and audio conferencing and campus emergency phones. Training and assistance with telephone etiquette and effective use of services is also provided.

UND also receives services through the North Dakota University System-System Information Technology Services (NDUS SITS). NDUS SITS provides UND with Campus Solutions, Finance and Human Resources (Oracle PeopleSoft) administrative systems, Wimba interactive video systems, wide area network resources, ODIN library services, and facilities and housing management systems.

Children's Center, University

525 Stanford Rd.
Phone (701) 777-3947
www.housing.und.edu/ucc

The University Children’s Learning Center offers child care to parents who are UND students or employees and also to parents of the greater Grand Forks community. The Center serves children ages 18 months to 12 years old and is open five days a week from 7:00 a.m. to 5:30 p.m. during the UND academic year and summer session. Daily attendance is limited to a full-time equivalency of 103 children.

The Center provides quality care and education to children from a variety of ethnic, cultural, socio-economic, and educational backgrounds and to children with special needs. Teachers have four-year degrees and work with an Early Childhood Education student teacher and/or teaching assistant to develop programming for children.

The University Children’s Learning Center provides experiential learning opportunities for UND students. Many Early Childhood Education teacher candidates utilize the Center for their student teaching experience. Other academic areas also use the Center for field experiences and observations focusing on Early Childhood Education.

For more information, call (701) 777-3947 or visit our website at: www.und.edu/centers/children, or write to the University Children’s Learning Center, 525 Stanford Road, Stop 9026, Grand Forks, ND 58202-9026. You are also welcome to visit and tour the Center.

Community Engagement, Center for

317 Cambridge Ave.
Phone (701) 777-0675
www.communityengagement.und.edu

The Center for Community Engagement links academic resources with community needs. The Center coordinates and supports opportunities for faculty and students to learn from and with nonprofit organizations, rural communities, tribal communities, and other public partners in the state. It works with departments, faculty, and students across campus; coordinates activities with other units with relevant teaching, research, and service mission; and develops relationships with public and community partners. The Center houses two main activities:

- **Experiential Learning**, including service learning, takes academic learning for credit out of the traditional classroom. Students apply their disciplinary knowledge or they serve communities and nonprofit organizations while learning civic responsibility. The Center assists students and faculty with the development of experiential learning opportunities in the curriculum.
- **Public Scholarship** includes scholarly and creative work in the public interest, scholarship planned and carried out in cooperation with community partners, and academic work that produces a “public good” such as exhibits, performances, and broadly accessible research results. Financial, technical, and promotional support is provided for a variety of research projects enabling UND to address public needs in North Dakota that might not yet be addressed.

The Center for Community Engagement is home to several projects with ties to communities locally and regionally and welcomes student, faculty, and community involvement, including an annual community-university forum,
programs that support neighborhoods, and activities connecting students to local professionals.

**Continuing Medical Education and Outreach**

School of Medicine and Health Sciences  
Phone (701) 777-3201

The Office of Continuing Medical Education and Outreach mission is to foster and support continuing professional development of health care professionals within the state of North Dakota and the High Plains region. The Office includes program offerings to physicians, faculty, nurses, physician assistants, and other health care professionals by conferences, workshops, seminars, review courses, symposia, lecture series, grand rounds and distance education. Last year the OCMEO office had more than 6,500 participants in over 222 programs throughout North Dakota. The program is an important link for lifelong continuing medical education opportunities.

**Counseling Center**

200 McCannel Hall  
Phone (701) 777-2127

[www.und.edu/counseling-center](http://www.und.edu/counseling-center)  
The University Counseling Center mission was designed to parallel the Strategic Priorities of UND. The University Counseling Center serves as an advocate for students promoting emotional, mental, and physical well-being by providing a wide range of Culturally informed Clinical, Educational, and Outreach Program services including (but not limited to):

**CLINICAL SERVICES**

• Individual, Couples, Group, and Career Counseling; Crisis Services; Trauma Assessment and Treatment  
• Addiction Counseling: Substance Use Assessment, Intervention, and Treatment (including Level 1 Outpatient Treatment Program)

**EDUCATIONAL SERVICES**

• Maintain American Psychological Association (APA) Accredited Doctoral Internship Program, UND Counseling Psychology and Psychiatry Practicum training program, A&D Consortium intern and International Association of Counseling Services (IACS) accreditation

**OUTREACH SERVICES**

• Outreach services include collaborative and consultative services provided to all campus entities upon request. Such services include lectures, presentations, workshops, and informal discussion with organizations, centers, and student groups

UND/UCC is committed to providing access and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request a disability accommodation to benefit from programs/services, contact UCC at least 10 days in advance at 701-777-2127.

If you have a crisis or an emergency after our normal weekday business hours or on the weekend, please call FirstLink at 701-777-2127 and press “1” to be connected to the crisis line.

**Student Rights and Responsibilities, Office of**

Memorial Union, Room 300  
Phone (701) 777-2664

The University of North Dakota Office of Student Rights & Responsibilities supports the campus learning environment and contributes to student learning and the overall safety and civility of the community.

We provide:

• General advisement and campus consultation  
• Student disciplinary services  
• Coordinate referrals and services for students in crisis or in need  
• Assist in problem solving or identifying appropriate services

**Dining Services**

(see Housing (p. 26) and Dining)

**Disability Services for Students**

190 McCannel Hall  
Phone (701) 777-3425 und.dss@und.edu

UND recognizes its responsibility for making reasonable accommodations to ensure there is no discrimination on the basis of disability, as established under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act.

Disability Services for Students (DSS) works with students to arrange disability accommodations on a semester by semester basis. DSS collaborates with faculty to provide accommodations, and consults with UND personnel about making all UND programs and services accessible.

Students planning to use accommodations register with DSS and submit current documentation of disability.

For more information, contact DSS or visit [http://und.edu/disability-services/](http://und.edu/disability-services/)

**Equal Opportunity/Affirmative Action**

401 Twamley Hall  
701.777.4171

e-mail: und.affirmativeactionoffice@UND.edu

[http://UND.edu/affirmative-action/](http://UND.edu/affirmative-action/)

**Notice of Nondiscrimination**

The University of North Dakota is committed to the principle of equal opportunity in education and employment. UND does not discriminate on the basis of race, color, national origin, religion, sex, age, disability, sexual orientation, gender identity, genetic information, creed, marital status, veteran's status, political belief or affiliation or any other status protected by law. Equal opportunity and access to facilities shall be available to all. This policy is applicable in employment, admissions and University-sponsored or approved programs and activities.

Pursuant to Title IX of the Education Amendments of 1972, UND does not discriminate on the basis of sex in its educational programs and activities, employment and admission. UND will promptly and equitably investigate reports of discrimination or harassment and take disciplinary action as appropriate. Information regarding sexual violence and Title IX can be found at [http://und.edu/title-ix/](http://und.edu/title-ix/).

Retaliation in any form against a person who reports discrimination or participates in the investigation of discrimination is strictly prohibited and will be grounds for separate disciplinary action.

Concerns regarding UND’s equal opportunity and nondiscrimination policies, including Title IX, Title VI, Title VII, ADA, and Section 504 may be reported at [http://und.edu/affirmative-action/incident-report.cfm](http://und.edu/affirmative-action/incident-report.cfm) or may be addressed to Donna Smith, Director of Equal Employment Opportunity/Affirmative Action and Title IX/ADA Coordinator, 401 Twamley Hall, 264 Centennial Drive Stop 7097, Grand Forks, ND 58202-7097, telephone 701.777.4171, email und.affirmativeactionoffice@UND.edu or donna.smith@UND.edu or visit the website at [http://und.edu/affirmative-action/](http://und.edu/affirmative-action/). A complaint or concern regarding discrimination or harassment may also be sent to the Office for Civil Rights, U.S. Department of Education, 500 West Madison, Suite 1475, Chicago, IL 60611 or any other federal agency.
Extracurricular Opportunities

Opportunities for engagement outside the classroom exist across campus. Colleges, departments, residence halls, fraternities, sororities, Student Government, as well as various other organizations sponsor programs and activities which contribute to the personal growth of students. Involvement activities provided by various departments and organizations include games and sports, social functions, dramatics, dances, music, films, lectures, and other programs. In addition, students may choose to participate in over 275 recognized student organizations, which are formed around academic pursuits, politics, athletics, social interests, culture, religion, service and other interests.

Believing that such participation contributes to the total development of the student, the University encourages students to participate in extracurricular programs. Complete information about student activities and volunteer opportunities are available from the Student Involvement Center on the main level of the Memorial Union.

Financial Aid Office

(see Student Financial Aid Office (p. 29))

Food Service

(see Housing (p. 26) and Dining)

Fraternity and Sorority Membership

Twelve national social fraternities and seven national social sororities have recognized chapters at the University of North Dakota.

Eligibility for membership in a fraternity or sorority is a mutual selection process between the individual chapters and individuals seeking membership. All individuals meeting certain minimum standards are eligible to join a group. Membership recruitment typically occurs at the beginning of the Fall and Spring semesters.

Fraternity and sorority life affords students a small group experience with opportunities for learning about interpersonal relationships, leadership, informal contact with administrators and faculty, and social relationships.

For further information, please contact the Student Involvement Center in the Memorial Union by calling (701) 777-4200 or by emailing: und.studentinvolvement@und.edu, or check out our website at: http://und.edu/student-life/student-involvement/fraternity-and-sorority-life/.

General Counsel, Office of

O'Kelly Hall, Room 104
221 Centennial Drive, Stop 8196
Phone (701) 777-6345

The Office of General Counsel is comprised of General Counsel, Associate General Counsel, and Assistant General Counsel. As the chief legal advisors to the President, officers, faculty, and staff of the University, members of the Office of General Counsel are responsible for handling all legal matters affecting the University. The office is also responsible for approving all requests for the use of off-campus legal counsel and the supervision thereof. Requests for outside legal services should be routed through the appropriate vice president. Services are not available to students.

Health Service

(see Student Health Service (p. 30))

Health and Wellness Hub

Main Level of the Memorial Union

Phone (701) 777-2097
und.edu/hwhub

The Health and Wellness Hub answers health related questions and assists students, faculty, and staff in accessing health and wellness services through a newly added interactive information station. A self-care station is available to check height, weight, blood pressure, and health risks. Free cold care kits, sexual protection items, quit tobacco kits and a comprehensive selection of health materials are provided. Peer education programs are available on the following topics: alcohol and other drugs, sexual health, general health, mental health, nutrition, tobacco, and physical activity.

Honor Societies

Alpha Eta Rho (1966) is an international aviation fraternity.

Alpha Kappa Delta (1966) is open to all students who have an interest in current social issues and a willingness to discuss feasible solutions and participate in activities which address those issues.

Alpha Lambda Delta (1950) aims to interest freshmen in the pursuit of learning and in high scholastic achievement.

Alpha Phi Omega (1947) is a National Service fraternity.

Alpha Phi Sigma is the only criminal justice honor society which is a certified member of the Association of College Honor Societies. It is also affiliated with the Academy of Criminal Justice Sciences.

Alpha Tau (1921) is the student organization of industrial technology.

Beta Alpha Psi (1923) elects from junior, senior and graduate students in accounting. Election is based on scholarship and promise in the field.

Beta Gamma Sigma (1926) elects to membership a limited number of academically outstanding students from the primary disciplines in Business Administration.

Delta Theta Phi promotes awareness of the role of the lawyer in the community and to further the objectives of the fraternity.

Epsilon Pi Tau is the international honorary professional fraternity for education in technology.

Eta Kappa Nu (1962) elects to membership a limited number of academically outstanding students in electrical engineering from the College of Engineering and Mines.

Gamma Sigma Alpha is a national greek honor society which recognizes juniors and seniors with a GPA greater than 3.5.

Gamma Theta Upsilon confers distinction for academic excellence in economics.

Honor Societies

International Honorary for Leaders in University Apartment Community (IHLUAC) recognizes exceptional apartment leaders.

Magna Iota provides social as well as academic outlet for graduate students in the counseling department.

Mortar Board (1932) aims to foster the ideal of service and to promote leadership and scholarship.

National Residence Hall Honorary (NRHH) recognizes and elects to membership the top 1% of the most involved residence hall student leaders.

Order of the Coif (1925) elects its members from the upper 10 percent of the third-year class in Law School.

Order of Omega (1984) is a society which recognizes service to community and academic achievement among members of the Greek system.
Phi Alpha (1962) elects to membership academically outstanding students of at least junior status who are majoring in social work.

Phi Alpha Delta (1911) is a fraternity in the School of Law.

Phi Alpha Theta (2004) is an international honor society for students in the field of history.

Phi Beta Kappa (1913) elects to membership a limited number of academically outstanding students from the College of Arts and Sciences.

Phi Beta Lambda (1970) is a national organization for students enrolled in business, office, or business teacher education programs.

Phi Delta Kappa (1924) elects those in Teacher Education on the basis of scholarship, personality, and professional ability.

Phi Eta Sigma (1929) elects to membership sophomores on the basis of high scholastic achievement as freshmen.

Pi Alpha Alpha (2006) aims to encourage and recognize outstanding scholarship and accomplishment in public affairs and administration.

Pi Sigma Alpha (1982) is an honorary society for political science and public administration.

Pi Theta Epsilon (1968) junior and senior students majoring in occupational therapy selected on the basis of scholarship.

Psi Chi is an honorary society in psychology.

Sigma Gamma Epsilon (1950) is a professional fraternity dedicated to the advancement of its members in the earth sciences, geology, mining, metallurgy, ceramics, and petroleum engineering.

Sigma Kappa (1980) is an honorary society for students in the field of management.


(National Society of Collegiate Scholars) recognizes scholastic achievement and promotes community service.

(National Student) Speech-Language-Hearing Association (1966) for majors in the area of speech pathology and audiology.

Tau Beta Pi (1974) (formerly Sigma Tau) elects to membership a limited number of academically outstanding students from the College of Engineering and Mines.

Tau Sigma (2005) is a national honorary that recognizes academic excellence of transfer students.

Upsilon Pi Epsilon (1987) elects to membership a limited number of outstanding students in computer science.

Housing and Dining

(Housing and Dining Services)

The mission of the Housing and Dining Services department is to enhance the University experience by providing exceptional housing and dining services and programs. As a campus community, we believe these programs set the foundation for student success at UND. Students learn and reinforce skills which foster citizenship, generate a sense of belonging, and build community.

Housing

525 Stanford Road, Stop 9029
(701) 777-4251
http://und.edu/student-life/housing

Student living facilities at the University of North Dakota include traditional residence halls, apartment style housing, and apartments for single students and families. For more information and 360 Tours visit the website at http://und.edu/student-life/housing.

Residence Halls

All first-year undergraduate students are required to live in a residence hall on campus for their first, full academic year. Exemptions to the live-on requirement may be considered. Students living in the residence halls are required to purchase a meal plan. For more information visit the website at http://und.edu/student-life/housing/residence-halls/on-campus-living-requirement.cfm.

Living and Learning Communities

Residence hall students may choose to be part of a housing community where students who share similar interests live together, enroll for similar courses, and learn together. Living Learning communities provide unique opportunities for students to participate in activities intended to provide interaction with faculty and extend learning beyond the classroom. Visit the website at http://und.edu/student-life/housing/residence-halls/living-learning.cfm for more information about available Living Learning Communities.

Applications

Students admitted to UND will be able to complete an online application for housing. Log in through Campus Connection (instructions are available at http://und.edu/student-life/housing). A non-refundable application fee must be paid during the online application process. Room assignments are made in accordance with the established priority system which is determined by the date of the receipt of the non-refundable application fee. Early application is encouraged.

Room and Meal Plan Agreement and Rates

Residence hall room and meal plan agreements are for the entire academic year (fall and spring semester) or summer session. Students will receive a copy of the agreement through the online application process. The agreement will provide information regarding important dates and refund policies for the year in which students are applying. Room and meal plan rates and agreements are reviewed annually and are subject to change. Releases from the Room and Meal Plan Agreement must receive approval from the Housing Office. Students may be assessed fees for early release from the agreement. For room and meal plan rates and agreement visit the website at http://und.edu/student-life/housing.

Apartments

The University manages more than 750 apartments (furnished and unfurnished) for single students and families. For more information about the specific types of apartments, current rates, eligibility criteria, and application forms, visit the website at http://und.edu/student-life/housing/apartments. Early application is encouraged. Assignments are made in accordance with the established priority system which is determined by the date of receipt of the application fee.

Complete information regarding on-campus housing may be found on the website at http://und.edu/student-life/housing or by calling the Housing Office at (701) 777-4251.

Dining Services

3625 Campus Road, Stop 9033
(701) 777-3823
http://und.edu/student-life/dining

UND’s Dining Services proudly serves the campus community with retail and residential dining options throughout campus. Two dining centers are open to students, faculty, and staff and are located in Wilkerson Commons and Squires Hall. A wide variety of menu items are available; check this website for details www.nutrition.und.edu/foodpro/.

First-year residence hall students are able to choose either the Unlimited Access or Unlimited Access Plus meal plan. Returning students can choose from one of the unlimited plans or available Block meal plans. Off-campus students, faculty, and staff may pay cash or purchase special meal plans. More information on meal plans can be found at this website http://und.edu/student-life/dining/meal-plans-students.cfm.
Dining Services offers resources to help students make good menu choices. Nutritional value of the daily menu served in the dining centers is available online at: www.nutrition.und.edu/foodpro/. Students with special dietary needs or food allergies need to self-report those needs to Dining Services staff or may meet with a UND Dining Dietitian.

Many retail locations across campus offer a wide selection of affordable dining options. Old Main Marketplace in the Memorial Union features A&W Express, Marco’s Pizza, and Dakota Deli. Stomping Grounds Coffee Shop in the Memorial Union and Wilkerson Commons serves coffee, espresso, specialty coffee drinks and features fresh baked items from the UND Bakery. Find hot entrees and grab n’ go breakfast and lunch items at the campus snack bars located in the Medical School and in the UND Aerospace building, Airport. Convenience stores are located in Wilkerson Commons, Walsh Hall, and the Memorial Union, and snack and juice vending machines are available at several locations on campus.

Hours of operations for the dining centers and retail locations vary and change during holidays and breaks. Check this website for the most up-to-date information http://und.edu/student-life/dining/index.cfm.

Campus Catering provides full-service catering for students, faculty, and staff and for University-affiliated or sponsored functions on campus. Contact Campus Catering whether your event is a breakfast meeting for six or a buffet for 700. For more information check this website http://und.edu/student-life/dining/catering.cfm or call (701) 777-2256.

Complete information regarding Dining Services may be found on the website at: http://www.und.edu/student-life/dining or by calling the administration office at (701) 777-3823.

Human Resources, Office of

313 and 312 Twamley Hall
Phone (701) 777-4361 (HR) and (701) 777-4226 (Payroll)

The Office of Human Resources supports the teaching, learning and advancement of knowledge and community service efforts of the University by providing advisement on policies and procedures on wages, employment and fringe benefit regulations; accurate and timely compensation for work performed ensuring all benefits are correctly deducted and reported to the appropriate agency; management and development training to supervisors and staff; maintenance of employees’ employment records; a fair and effective salary administration program; a broadbanding program including market data information; effective performance management and staff recognition programs, and ensuring compliance with all UND, SBHE, State and Federal rules and regulations.

The Office of Human Resources includes Learning and Development, which is designed to coordinate the planning and delivery of campus professional development and training activities for UND employees through an integrated approach to planning, marketing and program delivery. Additional information can be obtained by calling 701.777.3000 or toll-free 1.800.CALL.UND.

The Office of Human Resources adheres to the University’s equal opportunity/affirmative action policies. Additional information on employment, wages and benefits at the University may be obtained from the Office of Human Resources, 264 Centennial Drive, Stop 8010 (for HR) or Stop 7127 (for Payroll), Grand Forks, ND 58202; email at: und.humanresources@und.edu; or und.payroll@und.edu; or visit our websites at: www.humanresources.und.edu or www.und.edu/dept/payroll. UND Career Services should be contacted by students seeking part-time employment.

Information Technology

(See Chief Information Officer, Office of (p. 23))

Instructional Development, Office of

Room 300 O’Kelly Hall, 221 Centennial Drive, Stop 7104
Phone (701) 777-3225, FAX (701) 777-2925
und.oid@und.edu

www.oid.und.edu

The Office of Instructional Development (OID) is dedicated to enhancing the quality of teaching and learning at the University of North Dakota. Through its various activities, programs, and resources, OID promotes campus-wide conversations about teaching, fosters innovation and best practices in curriculum and instruction, advocates for and recognizes pedagogical excellence, and encourages the continued professional development of faculty as teachers.

In addition to providing grant support for teaching-related faculty travel and instructional projects, OID coordinates the Alice T. Clark/UND Foundation Mentoring Program for new faculty; sponsors faculty workshops, discussion groups and reading seminars; offers consulting to individual faculty, programs and departments; and provides other teaching and curriculum related support to UND faculty. OID also serves as the administrative home of the University Writing Program, which includes the University Writing Center and Writing Across the Curriculum (WAC).

Intercollegiate Athletics

Room 120 Hyslop Sports Center
Phone (701) 777-2234

A program of men’s intercollegiate athletic competition is offered in football, basketball, hockey, track and field, golf, cross country, swimming and diving, and tennis. The women’s program includes competition in basketball, cross country, golf, track and field, swimming and diving, soccer, hockey, softball, tennis, and volleyball.

General policies are determined by administration in conjunction with UND policies and procedures. In establishing athletic policies, the administration is mindful of the contributions that athletic participation, at an advanced level, can make toward achievement of the fundamental goal of a liberal education. Every effort is made to keep the athletics program compatible with that goal.

The program not only provides a powerful motivating force, encouraging the development of bodily strength, skill and agility, but also affords opportunity for invaluable experience in academic and athletics self-discipline, cooperation, and community service. The competitive events themselves provide recreation and entertainment for the student body, our alumni and greater community and contribute toward the development of students, fans and alumni loyalty and morale.

International Programs, Office of

International Center, 2901 University Avenue, Memorial Union Room 261
Phone (701) 777-4231, FAX (701) 777-4773
und.internationalprograms@und.edu
und.edu/academics/international-center

The International Center at the University of North Dakota supports and develops academic programs on campus and abroad. Our goal is to help prepare students to deal effectively with the growing interdependence of the world, as well as provide UND’s international population with a variety of immigration and student services. The International Center works to encourage global understanding through education abroad, cultural programming, and support of international students and scholars.

To achieve its goal, the International Center provides the following services:

• Advising international students, faculty, and staff on immigration, personal, and acculturation needs;
• Sponsoring intercultural events and promoting International Organization activities;
• Advising students, faculty and staff on international exchange opportunities;
• Coordinating UND education abroad programs with more than 45 universities in 20 countries, as well as a number of affiliated program providers;
• Providing information on Fulbright grants and other international faculty exchanges and development programs.
The International Center is composed of a director, two education abroad advisors, and three international student advisors.

The International Center is located on the 2nd floor of the Memorial Union in room 261. Office staff is available Monday through Friday from 8 a.m. to 4:30 p.m.; closed on weekends; holiday hours may vary. Comfortable study space is available. All are welcome.

**Legal Counsel**

*(see General Counsel (p. 25))*

**Libraries**

The University of North Dakota supports the largest library system in the state of North Dakota. With holdings of over 1.6 million volumes, as well as microforms and audiovisual materials, and access to over 62,500 online journals and databases, the UND libraries are dedicated to providing access to and information about scholarly resources in many different formats. The UND libraries are a major resource for students and researchers on campus or at a distance. The University’s library system includes the Chester Fritz Library and other libraries (Energy & Environmental Research Center, F.D. Holland Jr. Geology Library, Music Library, and the Wilson M. Laird Core & Sample Library), plus the Thormodsgard Law Library and the Health Sciences Library, which serve the graduate professional schools of law and medicine.

The Chester Fritz Library’s holdings support research and learning in the diverse fields of study within the University. The libraries serve as a major depository for state and federal documents, as well as providing reference service for patents and trademarks. The Elwyn B. Robinson Department of Special Collections includes published works, records and manuscripts documenting state and regional history and the history of the University of North Dakota.

The UND libraries are major contributors to the Online Dakota Information Network (ODIN), a statewide online catalog of library collections and resources. Through ODIN, students and researchers may search for information about materials held in the University of North Dakota libraries and in other libraries throughout the state.

The University’s libraries are members of many national and regional library consortia. Through these cooperative arrangements, the UND libraries are able to access and acquire information not held locally.

The UND Libraries provide many services, including assistance with Research Data Management Plans, Open Educational Resources, assistance with Digital Humanities projects, consultations regarding library resources or services for grant-writing, consultations regarding journal and citation analysis services for tenure or promotion dossiers, consultations regarding scholarly publishing, reference assistance, classes in information literacy, and consultations on specialized research topics. Librarians also team with faculty in presenting information in the classrooms.

Access to additional information about the libraries is available through the University of North Dakota homepage: http://und.edu/libraries.cfm.

**Memorial Union**

Phone 701.777.3926
INFO Center 701.777.4321

The Memorial Union’s mission can be stated in two words: “Serve Students.” As the “Heart” of UND, the Memorial Union is the gathering place of campus and provides services and conveniences for members of the campus community to utilize in their daily lives. As an integral part of the University’s educational mission, the Memorial Union complements the academic experience by providing students a wide range of opportunities to balance course work and free time as cooperative factors in their personal development and college experience. Overall, the Memorial Union is a vibrant center for campus life and is a source for programs, activities, events, services, and facilities that, when taken together, represent a well-considered plan for the community life of the university.

**Multicultural Student Services**

2800 University Avenue
Phone (701) 777-4259

Multicultural Student Services (MSS) provides culturally relevant, quality support services (academic, cultural, financial aid, personal, and social) to enhance successful transition, persistence, achievement, and graduation of domestic students of color at the University of North Dakota. The primary goal of MSS is to improve the quality of life for Latino-American, African-American, Asian -American, and mixed-race students and to enhance their persistence to graduation. MSS is committed to the success of all students at UND.

MSS serves as an institutional bridge and advocate for students, individually and collectively, and works with UND departments and offices to address the unique needs of students while providing culturally rich programming experiences which educate with compassion and inclusive practices. The staff provides advice and counsel regarding broad campus issues and promotes diversity throughout the campus and Grand Forks community. MSS is a socially just and inclusive department.

**Museum of Art, North Dakota**

261 Centennial Drive
Phone (701) 777-4195

The North Dakota Museum of Art, founded in 1972, is the official art gallery of the State of North Dakota and serves as the University of North Dakota’s art museum, with a primary focus on contemporary art by regional, national, and international artists. Exhibitions, featuring an array of traditional and contemporary art forms, change every two months. There is a Museum Shop and the Museum Cafe. Lectures and concerts are scheduled in the Museum on a regular basis. Located on Centennial Drive, south of Twamley Hall, the Museum’s hours are Monday through Friday, 9 a.m. to 5 p.m., and Saturday and Sunday, 1 to 5 p.m. There is no admission charge.

**Radio, UND**

314 Cambridge
Phone (701) 777-2577

The University has two FM radio stations, KUND 89.3 and KFJM 90.7. KFJM was first licensed in 1923 as a “landless wireless” station. Classical and contemporary music is broadcast on KUND, along with syndicated programming from National Public Radio. KFJM offers a mix of contemporary music, including jazz, pop, blues, folk and world music. Its emphasis is on locally produced and hosted shows.

Both stations are operated and managed by UND by Prairie Public, North Dakota’s public broadcasting network. KUND is part of a state-wide network. KFJM is broadcast in the Greater Grand Forks Community.

KFJM offers opportunities for UND students to get involved in local radio. For more information, contact KFJM at 777-2577.

**One-Stop Student Services**

136 Memorial Union
Phone (701) 777-1234
onestop@UND.edu

One-Stop Student Services is designed to provide answers to questions in one coordinated location to help students positively navigate through their educational experience. One-Stop is a collaborative effort with the Registrar’s Office, Student Financial Aid Office, Student Account Services, and Parking Services to provide assistance in one convenient location. Through the One-Stop operation, students, faculty, staff, and parents will find extremely knowledgeable, positively and proactively driven individuals who are dedicated to providing outstanding customer service in a highly energetic and dynamic environment.
RecSports

Student Wellness Center
801 Princeton St.
Phone (701) 777-3256

More than a game, Wellness Center RecSports lets you build friendships, strengthen your mind and body, develop character, and nurture skills. From badminton to basketball, RecSports offers organized play in over 50 team, individual or dual events each year in men’s, women’s, open, and coed divisions.

Sports and activities include: badminton, basketball, volleyball, broomball, ice hockey, in-line hockey, indoor soccer, dodgeball, flag football, and many more. The RecSports program is both administered and officiated by students of the University. Facilities used for RecSports programs are the Student Wellness Center, Ralph Engelstad Arena, Hyslop Sports Center, Aviation Foundation Property, and other Grand Forks Park District properties throughout the city.

In addition to competitive organized play, RecSports provides opportunities for students, as well as faculty and staff to take a break from their schedules and participate in healthy informal recreational opportunities such as open swim at the Hyslop and drop-in basketball, volleyball and indoor soccer. RecSports also offers students opportunities for employment and professional development as game officials, sports supervisors, and program managers.

RecSports fosters a spirit of competition and sportsmanship with activities to enhance both physical and mental health. The RecSports program supports the mission of the Wellness Center... “Our mission as the UND Wellness Center is to provide a culture of wellness that educates and impacts the UND community.” For more information, check us out on the web at: www.UND.edu/wellness (http://www.UND.edu/wellness), call (701) 777-3256, or come by Office 234 in the Student Wellness Center.

Registrar, Office of the

201 Twamley Hall
Phone (701) 777-2711
registrar@mail.und.nodak.edu

The Office of the Registrar maintains the academic record of each student enrolling for courses through UND’s instructional delivery systems. The University Registrar is Secretary to the University Senate. The Office is responsible for monitoring all academic policies and procedures relative to curriculum, registration, and grade processing. The transfer area evaluates transcripts and maintains transfer articulation agreements.

Religious Activities

Chapels on the UND campus include: Christus Rex Lutheran Campus Ministry (the Evangelical Lutheran Church in America), 701-775-5581; Wittenberg Lutheran Chapel (the Lutheran Church Missouri Synod), 701-772-3992; and St. Thomas Aquinas Newman Center (Catholic Campus Ministry), 701-777-6850. Each of these ministries holds regular worship services and has at least one full-time staff person. In addition, the University has the Hopper-Danley Spiritual Center available, which is a multi-faith chapel. Arrangements may be made with the University for its use. The three denominational chapels offer worship, fellowship, Bible study, Christian education, service to the community and social gatherings. They also have three respective student organizations: LSM (Lutheran Student Movement); LSF (Lutheran Student Fellowship); and FOCUS (Fellowship of Catholic University Students). A listing of additional student religious organizations is available on the UND website.

Research Development and Compliance

105 Twamley Hall
Phone (701) 777-4278

Research Development and Compliance (RD&C) provides various services to the institution in the research arena and to faculty and staff pursuing funding from external sponsors. Services to the faculty include the following: assisting faculty in locating funding opportunities; preparing grant proposals; negotiating terms and conditions of awards; providing training in grant-related activities; and serving as liaison between the University and sponsors. RD&C is also responsible for reviewing proposals for compliance with sponsor and institutional policies.

The Associate Vice President for Research in RD&C is the official authorized by the University to sign all proposals submitted to external agencies. Before proposals are submitted to RD&C for administrative review, the proposed budgets are checked and approved for compliance with the financial policies of funding agencies by Grants and Contracts Administration (GCA). The signing official is responsible for providing requested certifications and assuring compliance with policies and regulations required by the Federal government and other funding agencies. These policies and regulations involve human subjects, animal care and use, copyrights, intellectual property, responsible conduct of research, radioactive materials, export control, and recombinant DNA. The negotiation of contracts, grants, subcontracts, and subgrants is a joint process involving GCA, RD&C, and the Principal Investigator.

RD&C also provides administrative support to the Senate Scholarly Activities Committee, the Research Seed Money Committee, the Associate Deans for Research Committee, the UAS Research Compliance Committee, the Senate Conflict of Interest/Scientific Misconduct Committee, and committees required by Federal regulations, particularly the Institutional Review Board, which approves research projects involving human subjects; the Institutional Biosafety Committee, which approves research projects involving DNA and hazardous materials; and the.

Speech, Language and Hearing Clinic

Montgomery Hall
Phone (701) 777-3232

The UND Speech, Language and Hearing Clinic is part of the Department of Communication Sciences and Disorders. The clinic offers services to individuals with communication needs and is a clinical practicum site for graduate students in the CSD department. Services offered at the clinic are provided by faculty or graduate students.

The Speech, Language and Hearing Clinic provides evaluation, treatment and consultation services for adults and children with speech and language disorders, as well as hearing evaluations and evaluations for hearing aid candidacy. Moderate fees, based on a sliding scale, are charged for these services. The clinic also offers tutoring services to assist individuals learning English as a second language. Please call the clinic for additional information or to make an appointment.

Student Affairs, Division of

307 Twamley Hall
Phone (701) 777-2724

The Division of Student Affairs at UND provides leadership through comprehensive student support services to enhance the student learning experience both inside and outside the classroom. Our purpose is to support the academic mission of UND and to ensure students have the support they need to be successful. The Division also contributes to providing a campus environment where we embrace diversity and inclusiveness.

Under the direction of the Vice President for Student Affairs, a number of services, programs, and activities are available to assist students. Students needing assistance or information should contact the appropriate office as described in the various items in this section of this catalog, or may contact the office of the Vice President for Student Affairs, 307 Twamley Hall, phone 777-2724.

Student Financial Aid Office

216 Twamley Hall
Phone (701) 777-3121
sfa@UND.edu (sfa@email.und.edu)
The Student Financial Aid Office assists students and their families in meeting the costs of higher education by providing students with financial assistance and by providing families with access to options and information on financial planning to help students achieve their educational goals. The philosophy of the University of North Dakota is that the primary responsibility for financing a college education lies with the student and their family. The financial aid offered by the University is viewed only as a supplement to the family support. The amount of the student’s financial need is based on the difference between the cost of education for the school year and a contribution calculated from the family’s total financial resources.

Financial assistance is available to assist students with temporary emergencies as well as to provide long term funds for financing a college education. Students are offered financial assistance in various forms, including scholarships, grants, employment, and loan programs. More information on programs and procedures are available from the Student Financial Aid Office and in the Student Financial Aid section.

**Student Health Services**

100 McCannel Hall  
Phone (701) 777-4500

Student Health Services is an accredited, primary care clinic practice located in the heart of campus providing medical and psychiatric evaluation, treatment, referral (when necessary) and health education services. It is staffed by licensed, board-certified health care providers and other professional staff with a robust array of services: medical, laboratory, radiology, pharmacy, and nutrition therapy. **Students who have paid the University Health fees are eligible to utilize Student Health Services.** All charges are billed through Student Account Services; however, insurance claims will be filed for those individuals providing health insurance information at their visit(s). Pharmacy claims will also be filed for participating insurance plans. **Spouses of enrolled students may use Student Health Services;** please contact the clinic directly for current fee schedule.

**Specialty Services:**

Student Health Services also provides a full range of confidential psychiatric services including comprehensive evaluations and pharmacotherapy under the direction of a psychiatrist and psychiatric nurse practitioner. Our integrated clinical approach includes a review of previous treatment, a thorough diagnostic evaluation, and the proposal of a treatment plan. Student Health Services works in collaboration with the University Counseling Center. Together, we are committed to providing exceptional mental health care to students of the University of North Dakota. We may also make referrals to providers in the community for intensive or long-term treatment. Students have the option of receiving services via telemedicine provided by a Psychiatrist or on site visits provided by a Psychiatric Nurse Practitioner.

Physicals required by the Federal Aviation Administration (FAA) may also be scheduled at Student Health Services. **Flight physical services are available for students as well as private, commercial and military airline personnel.** The fee for student physicals will be charged to your University Account. Payment for non-student physicals is expected at the time of the appointment.

Anyone who is traveling to another country should be aware of the potential health risks associated with their travel. A travel consultation provides valuable, individualized information on recommended immunizations and tips on how to reduce your risk of injury or illnesses that are specific to the area you will be visiting. Student Health Services can also administer the recommended vaccines along with providing safety and disease avoiding tips relative to your itinerary. **Travel Consultations take about 1½ hours and are available throughout the year by appointment to students only for a minimal fee.** Please schedule a consultation at least 8 weeks prior to your departure date.

Office hours are Monday through Friday, 8 a.m. to 4:30 p.m. (Tuesday evenings until 6 p.m. during the spring and fall semesters). To make an appointment, call 701-777-3605 or 701-777-4500 or stop by the clinic. **Some appointments can be scheduled online through our Patient Portal** (https://myhealth.und.edu).

**What to Bring:** Student ID, Health Insurance Card, Medications - including vitamins, herbs and supplements.

**Study Abroad Office**

International Centre, 2908 University Avenue  
Phone (701) 777-4231  
und.studyabroad@und.edu

Studying abroad provides students the opportunity to immerse themselves in a foreign learning environment in order to further develop their understanding of the world and its people, their role as global citizens, and/or their foreign language skills. Students are able to earn courses that count towards their major requirements, essential studies, or general electives. The study abroad staff assists students in identifying study abroad programs that fit their academic and personal goals. Program offerings may be short-term (1-6 weeks) or one-to-two semesters in length. These may be faculty directed programs, exchange opportunities at UND partner universities, or opportunities through affiliated study abroad program providers.

In order to make the study abroad experience as safe and successful as possible, the University of North Dakota maintains certain policies to which students enrolling in study abroad programs are bound. It is the student’s responsibility to follow the policies delineated in the Study Abroad Handbook found at: und.edu/academics/international-programs/study-abroad/resources/handbook.cfm.

While on study abroad, students are bound by the UND Code of Student Life, the Academic Catalog, and federal financial aid regulations. If at any point during the study abroad process you have questions about the policies, please contact the Study Abroad Office. The Study Abroad personnel will do their best to follow the policies delineated in the Study Abroad Handbook, but please understand that world situations can change rapidly and we reserve the right to adapt our policies as necessary to safeguard the physical, emotional, and academic well-being of students studying abroad.

Eligibility requirements vary according to program, however, for most programs the requirements are:

- A minimum GPA of 2.5 at the time of application, to be maintained throughout the study abroad process inclusive of the term abroad
- Successful completion of at least 24 university-level credits (or sophomore status) before scheduled departure on the program, except the American College of Norway which requires just 15 university-level credits

Some programs have requirements that are more stringent. If you are unsure whether you will be eligible for your chosen program please ask.

For further information and to apply to study abroad, contact the Study Abroad Office at the International Centre, 2908 University Ave. Stop 7109, Grand Forks, ND 58202-7109, phone: 701.777.4231 email: und.studyabroad@und.edu

**Telecommunications**

NDUS IT Building  
Phone: 701.777.4111  
www.telecom.und.edu

(See Chief Information Officer, Office of (p. 23))

**Television Center**

Skalicky Tech Incubator, Room 110  
Phone (701) 777-4346

**Mission**

The University of North Dakota Television Center’s mission is to promote student development, offer quality production services, and provide programming that reflects the university’s mission and values. The following vision statements support the mission:

- Provide a quality internship program through Studio One.
• Provide high quality, innovative, and cost-effective production services to clients.
• Schedule and operate Grand Forks Cable Channel 3/97-1 and UND Cable Channel 98-1/116-1, Residence Life Cinema.
• Develop partnerships that will enhance the university through the use of television.

Services
The Television Center provides television production services to campus departments and organizations. Hourly rates are charged for services. To request services, contact the Television Center at 777-4346. The following services are offered:

• Studio Production: four-camera production with digital effects.
• Remote Production: two-camera production with special lighting effects.
• Editing: post-production services with graphics, digital video effects, narration and music library.
• Script development: research and writing services for documentary, promotional and news projects.

Written estimates will be provided after clients submit a Project Request form, which is available at: www.tvcenter.und.edu. The Television Center does not rent or loan equipment to groups, organizations or individuals.

Studio One

Studio One is a live television show produced by the University of North Dakota’s Television Center. The program, which debuted in the spring of 1987, is a one-hour broadcast similar to NBC’s Today or ABC’s Good Morning America. Students produce news, weather, sports and entertainment segments, and interview guests ranging from local people to national and international celebrities.

More than 4 million people can watch Studio One. The program is televised live on Thursday afternoons during the fall and spring semesters on Grand Forks Cable Channel 3/97-1 and UND Cable Channel 98-1/116-1, Residence Life Cinema. It is repeated several times during the week in the following North Dakota cities: Bismarck, Dickinson, Fargo, Grand Forks, Jamestown, Minot, Oakes and Ray. Minnesota viewers can also tune in. In addition to East Grand Forks, Studio One is distributed to more than 80 communities in the Twin Cities region by the Metro Cable Network. Prairie Public Television, North Dakota’s Public Television Network, also broadcasts the program across North Dakota, eastern Minnesota and southern Manitoba, which includes the Winnipeg metro area. Outside the region, viewers in select communities in Colorado, Michigan, Virginia and Wisconsin can watch Studio One.

Studio One provides opportunities for students from the University of North Dakota to gain practical experience in professional business setting. Students deal with every facet of creating a live television show by working in teams. Four teams create and promote the show: News, Weather, Production and Marketing.

To find out more about how you can become involved in Studio One or to attend a live performance, visit our website (www.studio1.und.edu) or call us at 777-4346.

Testing Services, UND

The College Level Examination Program (CLEP), DSST and numerous graduate or professional school entrance examinations (GRE, LSAT, etc.) are administered by UND Testing Services. In addition, the office administers career, self-assessment, or interest inventories. There may be a charge for some of the tests and assessment instruments. These tests and Pro metric Testing is available to students and patrons from the Grand Forks and surrounding communities.

Trio Programs

Student Support Services
Ronald E. McNair Program
3rd Floor, McCannel

The UND components of TRIO programs are funded by the United States Department of Education. Two are of interest to the UND student.

Student Support Services
(701) 777-3426. The Student Support Services Program provides academic and personal support to first generation (neither parent has a bachelor’s degree), economically disadvantaged students, and/or students with disabilities. The program provides academic assistance with individual and small group tutoring; review classes in math and science; course selection and registration; computer literacy; and career exploration. Students also receive assistance with financial literacy skills and securing appropriate financial resources. A variety of resources are available for students as they develop self-reliance, independence, and academic success.

Ronald E. McNair Program
(701) 777-4931. This program is designed for undergraduates who have completed their sophomore year and who are first generation and low income, or who are from a group underrepresented at the doctoral level of the targeted departments. The McNair Program encourages graduate studies by providing opportunities to define goals, engage in research, and to develop the skills and student/faculty mentor relationships vital to success at the doctorate level.

U Card

Room 136, Memorial Union
Phone (701) 777-1234
www.ucard.und.edu/

The U Card is the official University ID card and can be used at any campus service requiring identification. A government issued photo ID (driver’s license or passport) is needed at the time of requesting an ID. The U Card also allows access to, or service from, the bookstore, library, complex service centers, dining centers, athletic events, printing labs, and electronic door access.

Complete information about the U Card is available at the website: www.ucard.und.edu.

UND Alumni Association & UND Foundation

Gorecki Alumni Center
Phone (701) 777-2611 or (800) 543-8764

University of North Dakota pride stays with our graduates forever. The UND Alumni Association & Foundation fosters that pride so graduates keep connected with each other, stay engaged in what’s happening at the University and impact UND’s future.

Alumni relations programs and benefits reach out to more than 125,000 alumni and friends of the University. Alumni can get involved in chapter activities across the country to network with fellow alumni and enjoy school spirit. Other Alumni Association benefits include the Alumni Review magazine (online and in print), e-newsletters such as AroUND, insurance discounts, reunions, and returning to campus for Homecoming each fall. Connect with us at undalumni.org (http://www.undalumni.org), Twitter, Facebook, LinkedIn and Flickr.

The UND Foundation lean on the relationships and passion of graduates to support the future of our University. In fiscal year 2014, 11,751 donors made commitments to the University. New gifts, pledges, grants and bequests eclipsed $40 million; $12 million was earmarked for student support, including scholarships, and $6.8 million was earmarked for academic programs and faculty support. The UND Foundation manages more than 1,220 endowments, which help finance this support to the University. Donations can be made through the UND Foundation in any amount, designated to any entity on campus.

Alumni and friends are integral to the success of the University of North Dakota. Individuals give back in a variety of ways including intellectually, financially and through fan support. Every college, school, department, faculty member and student has benefited from the connections and generosity of alumni and
friends. This rich tradition was established by UND’s first eight graduates in 1889 and continues today.

University Relations, Office of
411 Tawmley Hall
Phone (701) 777-2731

As the institution’s central communication and public relations department, the Office of University Relations (OUR) generates awareness, understanding and support among the University’s many constituencies. Reporting directly to the President, OUR also maintains liaison with other units performing communications-related tasks, including affiliated but legally independent organizations such as the UND Alumni Association. University Relations has been given responsibility for encouraging an integrated marketing communication approach across the campus. The office also manages UND’s main website, www.und.edu.

The work of the Office of University Relations falls within two broad areas:

1. Projects initiated, funded and carried out directly by OUR, and
2. Projects involving partnerships with other UND departments or individuals in which University Relations serves as a central source of communications, creative and/ or organizational expertise.

In conducting projects and campaigns, OUR utilizes a variety of communication and action tools to reach the general public and special constituencies such as faculty, staff, students, alumni, the local community, educators, government officials, and business leaders. Among these tools are mass media publicity, advertising, OUR-produced periodicals such as “UND Discovery,” brochures and other printed materials, speeches and presentations, special events, direct mail, and personal contact.

Faculty, staff and students are encouraged to contact University Relations on matters that appear to come within the OUR mission. When help cannot be provided for reasons of time, budget or policy, a referral is generally made to another source of assistance.

University Writing Program/
Writing Across the Curriculum
12A Merrifield Hall
Phone (701) 777-3600
http://writingcenter.und.edu

The University Writing Across the Curriculum (WAC) program is a resource for faculty, departments, and programs teaching with writing. WAC provides professional development opportunities for faculty and consultation to departments and programs as they seek to achieve student learning outcomes in courses and in undergraduate, graduate, and professional programs. The WAC program is grounded in the beliefs that writing is a tool for learning and that the ability to write in various contexts draws on multiple knowledge areas and develops through repeated practice over time.

Among activities sponsored by the WAC program are workshops and consultation for departments, an annual course development workshop with a writing focus, teaching-with-writing lunch discussion groups, faculty writing groups, faculty study seminars focused on teaching with writing, and one-on-one consultation with faculty. WAC is also the home of the Writing Center, a place for students, faculty, and staff to talk about their work in progress with a writing consultant.

Veteran & Nontraditional Student Services
170 McCannel Hall
Phone (701) 777-3363
www.UND.edu/military

Veteran & Nontraditional Student Services offers military education benefits and certification, nontraditional student advocacy, advising support and programming/outreach. The office acts as a liaison between the student and the VA, provides students/veterans with information regarding VA policies and procedures, delivers information about the University, and assists students in the readjustment and adaptation to the university setting. The office also provides information on financial aid and tuition assistance. Referrals to other offices are made as appropriate.

All veterans need to drop off copy #4 of DD-214 to verify veteran status.

Wellness Center
801 Princeton Street
Phone (701) 777-WELL (9355)
UND.edu/wellness (http://UND.edu/wellness)

The Wellness Center, part of the Health and Wellness Unit, is more than a typical gym. It is a state-of-the-art facility that is committed to multidimensional wellness and enhancing the quality of life on the University of North Dakota campus. This gift from students offers plenty of weight and cardio equipment as well as gym space for informal recreation.

Unique features include the Culinary Corner demonstration kitchen, where members can learn how to cook healthy and nutritious meals, and dedicated quiet and meditation spaces such as the Hopper-Danley Memorial Quiet Lounge and the Zen Den. Other main attractions are the hand-sculpted rock wall, a circuit deck, and high-energy cycling studio. To enjoy all of these services, students pay for their membership in their student fees, while faculty and staff are able to purchase a membership.

This is a premier facility in our area, and the student employees make it happen! If you are interested in building skills that will last a lifetime, look online for information on recruitment sessions at: www.UND.edu/wellness (http://www.UND.edu/wellness), or by calling 777-WELL. Let us be part of your collegiate experience!

Women’s Center
Room 262, Memorial Union
Phone (701) 777-4300, Fax (701) 777-2307
undwomenscenter@und.edu
http://www.und.edu/student-life/womens-center

The Women’s Center at the University of North Dakota provides a safe, respectful, and supportive environment for students, faculty, and staff. The Center’s role is to celebrate the diversity of people and thought and to advocate for positive personal and societal changes which serve to promote healthier lifestyles for all people. Ongoing programs include “Meet, Eat & Learn” (discussion-based programs), self-defense classes, and numerous outreach programs. Information and specifics as to dates and times of scheduled events can be obtained by contacting the Women’s Center or consulting the website listed above. Conferences and programs relative to celebrating the lives of women are held periodically throughout the academic school year. A lending library, resource room, and computer/study area are available for students. The Women’s Center is open Monday through Friday from 8:00 a.m. to 4:30 p.m.

Writing Center
12 Merrifield Hall
Phone (701) 777-2795
writing.center@und.edu
http://writingcenter.und.edu

The Writing Center is a place for students, faculty, and staff to talk about their work in progress with a writing consultant. We help people as they seek to improve their writing by offering positive, constructive responses to their work in any genre or discipline and at any stage of the writing process. We believe that the development of writing abilities is a life-long process, and that writing is a skill and art that enables people to create and communicate ideas.

In addition to offering one-on-one consultations, the Writing Center maintains a collection of resources for writers and houses a computer lab for all students. During the fall and spring semesters, the Writing Center is open Monday-Friday from 10 a.m. to 4 p.m. and Sunday through Thursday from 7 p.m. to
9 p.m. To work with a consultant, schedule an appointment online at: http://writingcenter.und.edu.
Information Sources About UND

Grand Forks, North Dakota

Freshman Student Applications and Undergraduate Transfer Student Applications

Visit and Tour Arrangements

Office of Admissions,
University of North Dakota, Gorecki Alumni Center,
3501 University Avenue, Stop 8357, Grand Forks, ND 58202-8357

ONLINE: www.go.und.edu

Telephone: (701) 777-3000
(800) CALL UND
(701) 777-0424 TTY Service Only
email: admissions@und.edu (und.admissions@und.edu)

Graduate Student Applications

Visit and Tour Arrangements

Write: School of Graduate Studies,
University of North Dakota
Twamley Hall, Room 105, 264 Centennial Drive, Stop 8178
Grand Forks, ND 58202-8178

ONLINE: www.graduateschool.und.edu

Telephone: (701) 777-3858
(800) CALL UND, ext. 3858
(701) 777-2947 TTY Service Only
email: questions@gradschool.und.edu

Internet Home Page

http://und.edu/

(Also see the A-Z Index (http://und.edu/a-z) to find the location of more specific subject matter.)
New Undergraduate Student Information

Enrollment Information About UND

The following pages of the catalog contain information about admission policies, costs, student financial aid, and housing. The Office of Admissions serves as the central contact point for enrollment information about the University. It provides information to prospective students through printed materials, visits to high schools and college fairs, tours of the UND campus, and personal contact over the telephone, by email or on a face-to-face basis. The mailing address is: Gorecki Alumni Center, 3501 University Avenue, Stop 8357, Grand Forks, ND 58202-8357. The online application can be accessed at go.UND.edu. The office telephone number is 701.777.3000. UND will accept applications up to one year in advance of the semester the student plans to start.

Admission of Freshman (Non-Degree and Early Entry)

Undergraduates may be admitted to the University in one of two categories: Regular Admission (full-time or part-time); and Non-Degree Seeking Admission. See below for definitions of these admission categories. For provisions governing admission to the School of Graduate Studies, Law School and the School of Medicine and Health Sciences, applicants should consult the respective sections for those schools.

Types of Admission

Regular Admission

Regular Admission is granted to a student who has been determined to be eligible and is duly enrolled as a candidate for a degree.

Non-Degree Seeking Admission

Non-degree Seeking Admission is a special admission status reserved for students who wish to enroll in a limited number of courses at UND. Students admitted with this status will be allowed to attempt up to a total of 15 credits at UND and are not eligible for financial aid. Enrollment in courses beyond 15 credits will be contingent upon meeting all admission criteria for regular admission.

Admission of First-Year Students

For first-year students, admission is based on the following minimum criteria:

- High school GPA unweighted of 2.75
- ACT of 22 (fall 2017) or SAT of 1100 (fall 2017) scores based on SAT test taken on March 5, 2016 and after (including sub-test scores)
- Completion of the high school core curriculum for college readiness
- Additional factors will be considered, such as course rigor, grade trends, core GPA, etc.
- Completion of safety and security form

Students are encouraged to apply for admission even if their GPA, ACT and safety and security responses do not meet these admissions guidelines. All applications that are not yet eligible for admission will be reviewed by the Office of Admissions, the Student Academic Standards Committee (transcripts, test scores) or the Admissions Safety and Security Committee (criminal history records) to consider all relevant information and extenuating circumstances in order to make an admission decision that is in the best interest of the student and institution.

Students applying for admission to UND are required to take one of the standardized college entrance exams; however, students 25 years of age or older are not required to submit test scores, but these scores may be requested for admission. The ACT or SAT I: Reasoning Test is accepted. Standardized test scores at UND are used for scholarships, placement, and advisement, as well as admission criterion. It is recommended that students take the ACT late in their junior year. Applicants to UND are exempt from the ACT writing essay component under UND campus procedure.

All students who graduate from high school, whether in North Dakota or in any other state, and who are age 25 or older on the first day of class, are exempt from meeting the required core college readiness curriculum before entering any four-year North Dakota University System institution.

Below is the list of core courses at the secondary level which are required for admission for 2017 (total of 14):

- Four units of English, including the development of written and oral skills;
- Three units of mathematics, including Algebra I and above;
- Three units of laboratory science, including at least one unit each in two or more of the following courses: biology, chemistry, physics or physical science;
- Three units of social studies, excluding consumer education, cooperative marketing, orientation to social science and marriage and family.

Note: One additional core course is required for fall 2018 (total of 15).

UND may admit some students who have not completed the required courses. The Student Academics Standards Committee will consider exemptions to the policy because of special circumstances. Students denied admission by the Committee are not permitted to attend UND.

The Office of Admissions may deny applicants who meet the core curriculum requirements but are evaluated to be high-risk candidates for success at UND due to a low ACT, low SAT, low high school grade point average, or any of the other admission criteria listed above.

Students who have not had the required courses are encouraged to enroll in any of North Dakota’s colleges/universities. Upon successful completion of 24 transferable semester credits and a minimum 2.0 GPA, these students may transfer to UND and are exempt from meeting the high school core course requirements.

A student who has not graduated from high school may be admitted to the University by completing the test of General Educational Development (GED). Beginning January 2014 the new GED minimum test score of 145 is required for admission. A minimum score of 410 or above on each exam and an overall average of 500 on the entire test for those tested in 2002 or later. For students testing prior to 2002, an average of 45 and subject scores no lower than 40 are required. For more information regarding GED test content and registration, contact UND Testing Services at (701.777.4157. GED testing scores are posted on the Admissions website.

The University is approved under Federal law to admit non-immigrant alien students. Students whose education has been outside the United States should make early contact with the Office of Admissions for questions concerning admission.

International students

International students applying for undergraduate admission and all students whose first language is not English are required to earn a score of at least 195 computer-based or 71 Internet-Based on the Test of English as a Foreign Language (TOEFL) and/or 6.0 on the International Language Testing System (IELTS) to be considered for admission to UND as outlined in SBHE policy. The International Programs Office provides assistance and counseling to students from countries other than the United States.

Canadian students

Canadian students are required to complete Grade XII and to meet high school core curriculum admission requirements. They must also complete the ACT or SAT and request that the official results be sent to UND to be eligible to enter the University as freshmen. All students who graduate from high school, and who are age 25 or older on the first day of class, are exempt from meeting the required core college readiness curriculum before entering any four-year North Dakota University System institution.
Early Entry High School Students

Early Entry High School Students are applicants who have taken college-level coursework while in high school. Students may receive credit for courses taken at an accredited university/college while in high school if those courses are acceptable for credit at the University of North Dakota. Courses applied toward College requirements must be approved by the Dean of the College. Courses applied toward major requirements must be approved by the Departmental Chair.

Admission Tests

It is required that each applicant for admission who completes the ACT request that official scores be sent directly from ACT to the Office of Admissions. Students who complete the SAT I: Reasoning Test (SAT) may request official test scores be mailed to the Office of Admissions. The University prefers the ACT report since it provides information, in addition to test results, which is helpful in advising students. It is to the student’s advantage to take the test at the earliest possible test date during the latter part of the junior year.

Information on test dates may be secured from the high school principal, counselor, or the UND Testing Center or any of the colleges in the state.

Advanced Placement

A student from a high school which offers college-level courses through the College Entrance Examination Board Advanced Placement Program may be given University credit and/or advanced standing in individual subjects. This may be especially desirable if he or she wishes to proceed to the next higher level. Under this plan the student takes an advanced placement examination given at his or her school by the College Board. These examinations are scored by the College Board and are forwarded to the college of the student’s choice. The amount of credit given will then be determined by the department best qualified to evaluate the material. Students with special preparation in academic areas (foreign language, etc.) are urged to take advantage of the Special Examinations for credit available in selected disciplines. See the Special Examinations for Credit (p. 40) section.

International Baccalaureate Diploma

The International Baccalaureate Diploma is recognized for the purpose of admission to the University of North Dakota. Specific course credit for advanced standing will be evaluated and determined by the department and college in which the course is offered.

Note to students intending to enroll in mathematics courses: Students planning to take entry-level mathematics courses at UND MATH 92 Algebra Prep II, MATH 93 Algebra Prep III, MATH 103 College Algebra, MATH 105 Trigonometry, MATH 146 Applied Calculus I, MATH 165 Calculus I, MATH 208 Discrete Mathematics shall be enrolled in their beginning mathematics courses only after taking a math placement test or receiving a sufficiently high score on the ACT Mathematics test. Students who have received college mathematics credit need not take the placement exam. UND’s Mathematics Department strongly advises all transfer students who plan to take courses in or major in math, to take UND’s Math Placement Exam and to consult with their advisor at UND to help determine the best starting point in UND’s math curriculum.

The mathematics placement tests are used for placement purposes only. Passing these tests does NOT grant credit. Credit for MATH 103 College Algebra and/or MATH 105 Trigonometry without taking the course(s) is available only through CLEP examinations. Two placement exams are used. Students planning to take MATH 165 Calculus I should take the Trigonometry and Elementary Functions Exam. All other students should take the Algebra Exam. Placement test results will determine beginning placement in MATH 92 Algebra Prep II, MATH 93 Algebra Prep III, MATH 103 College Algebra, MATH 105 Trigonometry, MATH 146 Applied Calculus I, MATH 208 Discrete Mathematics, MATH 165 Calculus I, or MATH 277 Mathematics for Elementary School Teachers. Ask your advisor, or contact the mathematics department, concerning time and place of these tests. * MATH 92 Algebra Prep II and MATH 93 Algebra Prep III credits do not count toward graduation.

Credit by Examination Through CLEP

CLEP stands for College-Level Examination Program of the College Board. It is a national program that offers the opportunity for a student to obtain recognition for college-level achievement based on intensive reading in a particular field, adult school courses, correspondence courses, television or radio courses, courses on tape, or other means of formal or informal preparation. UND accepts credit on CLEP subject examinations only. See the section on CLEP (p. 40) for additional information.

Enrollment in the University

All students will be enrolled, based on their declared major, in one of UND’s academic colleges. Students who have an undeclared major will receive assistance from the Student Success Center. Once a student declares a major, he/she will be enrolled in the appropriate academic college. Enrollment in an academic college does not guarantee admission to the college or specific academic programs. (For more information regarding additional requirements for admission to colleges and programs, see the listings for individual colleges).

How to Apply:

1. The online application for admission can be located on the web at: go.UND.edu (http://und.edu/admissions). The application priority deadline is March 1.
2. All applicants are required to complete the online application and submit the non-refundable $35 application fee. In addition, freshmen must request their high school send an official transcript of their records directly to the Office of Admissions.
3. The freshman applicant is required to take the ACT or SAT and request that the official scores be sent to 3501 University Avenue, Stop 8357, Grand Forks, ND 58202. ACT Scores = UND Code #3218. SAT Scores = UND Code #6878.
4. All applicants are required to complete the safety and security questions on the online application.
5. Each applicant must provide the Health History & Immunization Form completed by his or her family physician or mailed from his/her high school. This form is provided online to each accepted student and should be returned to the Student Health Service before enrollment.
6. Beginning fall 2016, all new admitted full-time students who wish to enroll at the University are required to submit a non-refundable $200 confirmation deposit. By May 1 (set by the National Association for College Admission Counseling) to reserve their seat. The deposit will be applied to their tuition bills. Students can still confirm after May 1 priority deadline, space permitting.

When to Apply: UND will accept applications up to one year in advance of the semester students plan to start.

Admission of Transfer Students

Specific admission requirements for transfer students are based upon the total number of transferable college credits completed from a regionally accredited institution at the time of application.

Transfer students who have completed 24+ transferable semester credits must meet the following criteria to be admitted to UND:

- Have a minimum of a 2.0 cumulative transferable college GPA
- Be in good standing at all college(s) previously attended

If transfer students completed fewer than 60 transferable semester credits, they must verify high school graduation by submitting all official high school transcripts directly to the UND Office of Admissions.

If transfer students have completed fewer than 24 transferable semester credits and are under the age of 25, they must submit official ACT or SAT test scores.

Applicants who have enrolled in a college or university other than the University of North Dakota and who are applying for admission must submit all required official documents to the Office of Admissions before any information regarding their status will be provided. In addition, students who have attended an institution of higher education outside of the United States, including those who participated in Study Abroad programs, must submit a course-by-course evaluation through World Education Services at: www.wes.org (http://www.wes.org). Most Canadian universities do not require a course-by-course evaluation. A student will be notified if a course-by-course evaluation is needed.
All claims for transfer credit must be made within the semester in which the student matriculates.

The Office of the Registrar evaluates and records transfer credit. Students with unsatisfactory records, as well as students who have been asked to withdraw from other institutions due to unsatisfactory scholarship or behavior, ordinarily will not be allowed to enter the University. If special permission for admission is granted, the student is placed on academic probation.

Students who owe money to previous institutions and who cannot submit an official transcript are not eligible for degree seeking admission.

**International Student Transfer Admission**

International students applying for transfer admission must submit an application for admission, a certification of finances form, and official transcripts/academic records from all post-secondary schools attended. In addition, the Test of English as a Foreign Language (TOEFL), with a score of 195 Computer-Based, 71 Internet-Based, and/or 6.0 on the International Language Testing System (IELTS) for undergraduate students enrolling at a UND as outlined in SBHE policy, is required for all students whose native language is not English.

If transferring from a college or university outside of the United States, a course-by-course evaluation of non-U.S. post-secondary credentials is required. The evaluation form may be obtained at: http://www.wes.org. The WES ICAP evaluation must be submitted in addition to all official transcripts/academic records from all post-secondary schools attended, along with word-for-word English translations.

If transferring from a college or university within the United States, a foreign student advisor reference form is required.

Note: The student will be notified if a course-by-course evaluation is needed from a Canadian university.

**Eligibility**

Students in good academic standing may apply for admission after completing 24 credits from a regionally accredited institution that they are currently attending. Students who have less than two full-time semesters or less than 24 credits and who are not in good academic standing at their current institution can petition the eligibility for admission after four years of not attending an institution. The transfer student is not at liberty to disregard any part of his or her previous college record. Former students of other institutions may not enter as new freshmen on the basis of secondary school records. Violation of this regulation will be regarded as a serious offense and may result in the student's dismissal from the University.

Students transferring from outside the state of North Dakota to the University must have maintained at least a "C" average at the colleges or universities which they previously attended. Some colleges in the University require higher averages in selected major programs. These requirements are described in the specific college listing in this catalog.

**Transfer Credit**

An official transcript from each of the student's former institutions must be submitted for review. Upon receipt of the student's transcripts, the Office of the Registrar will determine which credits will transfer as well as how those credits will be applied toward the University of North Dakota's General Education requirements and/or Essential Studies requirements. How the accepted courses may be used toward the student's major is determined by the individual college or department from which the student plans to receive his/her degree. Students should read specific information about their school or college requirements in this catalog and should contact an advisor in their major to determine course applicability.

A credit summary, indicating only the number of credits transferred and the institution of origin, will be posted to the student's University of North Dakota transcript after the student has been admitted to the University. A detailed listing of transferred courses will be available to both student and advisor. All of the student's previous undergraduate work becomes part of the student's permanent UND record. All transfer work shown on the student's official transcript will be summarized in semester credits. Work transferred from institutions that use quarter or other systems will be converted to semester credits.

The University of North Dakota participates in the General Education Requirements Transfer Agreement (GERTA) with other North Dakota institutions. Students who have completed their general education requirements at another North Dakota institution recognized by GERTA should request proof of this completion be sent to the UND Office of the Registrar. Students who have completed an Associates of Arts degree or who have completed their general education requirements at another North Dakota University System (NDUS) institution will be deemed to have completed the general education requirements at UND.

In general, all college-level credit attempted at a regionally accredited institution of higher education will be posted in transfer by UND. There are certain exceptions to this rule, and those exceptions include, but may not be limited to, the following:

1. Remedial or preparatory courses
2. Credit granted for life experience by other institutions
3. Institution-based credit by examination
4. Non-degree continuing education courses

Credit for military courses and training may be granted, but students requesting this credit must produce an official training record. Students should consult the military branch under which they served to have an official copy of this record sent to UND. The American Council on Education’s (ACE) Guide to the Evaluation of Educational Experiences in the Armed Forces will be used to determine whether or not credit is granted and only credit listed as either lower division baccalaureate or upper division baccalaureate credit will be considered.

Students transferring college credit from all institutions outside of the United States, with the exception of Canadian institutions, must have their transcripts evaluated by an international transcript evaluation company prior to being admitted to UND. Students who need more information about how this evaluation is performed may go online at: http://www.wes.org. Canadian students’ work will be evaluated on-site in the Office of the Registrar.

Credits not successfully completed (grades of F) that would transfer if successfully completed will also transfer to the University and will affect the students' cumulative grade point average. Transfer students from two-year colleges (junior or community colleges) are required to complete a minimum of 60 semester hours at a four-year college. The last 30 credits toward the degree must be institutional credit at the University of North Dakota.

To qualify for a degree a student must achieve a minimum 2.00 (C) average on all University work. For transfer students, it is required that the overall average (including transfer work) be 2.00 (C) and that the average of work taken at the University of North Dakota be 2.00 (C). Some colleges require a higher grade point average for graduation and this requirement is indicated in the specific college description in this catalog.

**How To Apply:** The online application for admission can be located on the web at: go.UND.edu (http://www.und.edu/admissions).

1. All applicants are required to complete the online application and submit the non-refundable $35 application fee.
2. Although an applicant's records from several institutions may be summarized on one transcript, an application will not be considered until official transcripts from each college attended are received direct from the awarding institution to the Office of Admissions. These are required even though no credit may have been earned at an institution.
3. Students who have earned fewer than 60 transferable semester credits must submit a high school transcript. Students with fewer than 24 transferable semester credits are required to submit their official ACT UND school code (#3218) or SAT UND school code (#6878) to UND. If students are 25 years of age or older on the first day of class, they are not required to submit their ACT or SAT scores. However, if they've taken either exam, it's highly recommended that they submit their official scores for proper placement into English and math courses. All official documents should be mailed directly from the high school and college and testing center to the Office of Admissions at 3501 University Avenue, Stop 8357, Grand Forks, ND 58202.
4. All applicants are required to complete the safety and security questions on the online application.
5. Each applicant must provide the Health History & Immunization Form completed by his or her family physician or mailed from his/her high school. This form is provided online to each accepted student and should be returned to the Student Health Services before enrollment.

6. Beginning fall 2016, all new admitted full-time students who wish to enroll at the University are required to submit a non-refundable $200 confirmation deposit, by May 1 (set by the National Association for College Admission Counseling) to reserve their seat. The deposit will be applied to their tuition bills. Students cannot confirm after May 1 priority deadline, space permitting.

When to Apply: A transfer applicant may submit an application as soon as he or she has registered for the last term she is attending at the current institution. Transfer students who are accepted to the University will receive follow-up information about registration.

Orientation Programs for New Students

The University of North Dakota holds orientation programs for new students (freshman and transfer students) each semester. The emphasis is on acquainting students with people, programs, and resources at UND and the surrounding community, along with an opportunity to register for courses and interact with academic colleges and departments. New students will be informed of the dates, times, and specific details. Orientation information can also be found at: www.und.edu/orientation.

Readmission of Former Undergraduate Students

Undergraduate students who leave the University for at least one complete semester (excluding summer terms) are required to submit an application for readmission to the Office of the Registrar. Returning graduate students should refer to the Graduate (p. 345) section. Readmission to the University does not guarantee readmission to a particular degree program at UND. The Request for Readmission form is available from the UND Office of the Registrar website or upon request from the Office of the Registrar. Students who were previously suspended from the University must be reinstated by the dean of the school or college to which they wish to be admitted before applying for readmission. Students who were previously dismissed from the University must petition for reinstatement to the Student Academic Standards Committee. Submit the petition to the Office of the Registrar, 201 Twamley Hall.

Students who have enrolled in courses from other institutions during their time away from UND must have official transcripts sent from each institution attended. Failure to declare attendance at another institution is cause for dismissal and may result in cancellation of registration or any earned degrees to be revoked. Students whose institutional and cumulative GPA’s are below 2.00 based on all post-secondary work accepted by the University may be denied readmission or may be readmitted on probation. Students whose GPA is under 2.00 will be allowed readmission to UND only upon the approval of the dean of their prospective school or college.

Undergraduate Academic Information

Introduction and Background

This section of the catalog summarizes many of the academic policies and procedures which will apply to the student during his or her undergraduate years at UND. Particularly important are the passages describing the University’s essential studies program. Since institutional policies may change between catalog publication dates, students are encouraged to consult with their academic advisor whenever appropriate. Students with questions also should request information from their academic department, the dean’s office of their college, and the various administrative offices on campus.

Before utilizing the information found in this catalog, it may be useful to review the following basic patterns of undergraduate education at the University of North Dakota.

The student’s place in the University organization

New students are admitted, according to the major they wish to pursue, to one of UND’s undergraduate degree granting colleges, e.g., Arts and Sciences. All students who have an “undeclared” major under General Studies in the College of Arts and Sciences will receive assistance from the Student Success Center. Once a student declares a major they will be enrolled in the undergraduate degree granting colleges for that major. Each college is made up of groups of academic departments and/or programs (e.g., history). Courses in the student’s major will normally be taken in a specific department, although UND offers many interdisciplinary majors as well. It should be noted that course work in one’s major field normally makes up only a fraction of the total credits required for graduation (typically about one-fourth). Thus, throughout their undergraduate days, students have the opportunity to take courses in many departments outside their home college. Indeed, this diversity is one of the advantages of attending a multipurpose university such as UND.

As an institution of higher education, the university is committed to ongoing assessment of student learning at all levels and in all programs. Assessment of student learning is essential in order for the university to improve educational programs and the experiences of students. Students are urged to respond positively when asked to participate in assessment activities. Students are also encouraged to collaborate in the planning and development of assessment activities and to make suggestions for improvements.

University, college and departmental requirements

Undergraduate students must meet three sets of requirements to graduate from the University of North Dakota:

1. University graduation requirements,
2. requirements of the UND college or school granting the student’s degree, and
3. the requirements of the student’s major department or program area.

Which catalog to use

The graduation requirements of the University and its colleges, schools, and departments, as published in the catalog in effect at the beginning of the first semester the student is enrolled at the University, are those which must be met for completion of an undergraduate degree program. Subsequent changes in policies and requirements, as published in the catalog or amended by the University Senate and the Board of Higher Education, may be substituted. The faculty reserves the right to make changes in curricula at any time when in its judgment such changes are for the best interests of the students. Courses listed in this catalog are subject to change through normal academic channels. New courses and changes in existing course work are initiated by the responsible departments or programs and are approved by the appropriate dean and college or school curriculum committee, the University Curriculum Committee, the University Senate, the Vice President for Academic Affairs, and the Board of Higher Education.

Advisement

The University encourages continuing communication between faculty and students to enhance the advisement process. The student has final responsibility to meet the stated requirements for the degree sought, as listed in the appropriate catalog or bulletin. Every student is held accountable for complying with the information contained in this catalog and the Schedule of Courses for each term. The University provides an electronic degree audit for each student as a guide and for discussion with the academic advisor. Registration is the student’s personal responsibility.

Academic Advising Philosophy Statement

Academic Advising is an integral component of undergraduate education at the University of North Dakota. The focus of all academic advising is to assist students in taking responsibility for developing meaningful educational plans which are compatible with their life goals. It is a decision-making process
by both student and academic advisor. The sharing of information occurs in a caring and comfortable environment which promotes responsible and appropriate academic choices. Through a quality advising process, academic advisors strive to facilitate a successful academic experience for students. Successful advising is an interactive relationship in which both student and advisor must take responsibility for a successful outcome.

Degrees Granted

The University of North Dakota offers both undergraduate and graduate courses of study leading to degrees in many academic disciplines. See the section of undergraduate majors and minors (p. 47) for specific listings. Curricula for specific majors will be found in the Courses of Instruction section of this catalog. See the section about the School of Graduate Studies (p. 623) for a description of graduate degrees and a listing of the fields of study open to graduate students. Sections of the graduate professional Schools of Law and Medicine also are included. The two professional schools publish separate bulletins, which are available upon request.

The Purposes of a University Education

UND’s Philosophy of Essential Studies

As a Liberal Arts institution, UND believes that the Essential Studies (General Education) program is the foundation of a student’s degree, regardless of their specific major. While completing their Essential Studies courses, students are encouraged to explore a range of content areas and to develop broad learning abilities. Students’ Essential Studies courses should anchor their future university work and provide a model for life-long learning. Students are encouraged to consult with their academic advisor when choosing Essential Studies courses and to be particularly mindful of the ES program’s special emphasis on specific learning skills. (These courses are designated on the website.) Finally, all UND Students will complete an Essential Studies Capstone course, to be taken no earlier than the second semester of their junior year. By choosing courses that complement each other, students can reinforce and enhance the knowledge and abilities acquired in each course, as well as develop the ability to recognize relationships.

Oversight of the Essential Studies Program is the responsibility of the Senate Essential Studies Committee, a committee of the University Senate comprising student, faculty, and administrative representatives from across campus. UND’s full philosophy of Essential Studies, the specific requirements of the program, as well as the current and archival lists of courses (http://und.edu/academics/essential-studies/approved-courses.cfm) that satisfy the requirements, can be found at the ES committee website: http://und.edu/academics/essential-studies/.

The North Dakota University System Transfer Agreement

The University of North Dakota participates in the General Education Requirements Transfer Agreement (GERTA) with other North Dakota institutions and the NDUS transfer agreements with Washington, Oregon, the South Dakota system, the Montana University system, MnSCU institutions, Wyoming Community Colleges, and California Community Colleges. For more information, details, and qualifications for the state articulation agreements, consult: www.ndus.edu/makers/procedures/ndus (http://www.ndus.edu/makers/procedures/ndus), 400s Academic Affairs.

University Graduation Requirements

A minimum of 125 semester hours of credit is required for a baccalaureate degree. Transfer students are required to complete a minimum of 60 credits at four-year institutions. The last 30 credits must be UND institutional credit. Institutional credit is academic credit awarded by the University. The following sections describe the requirements which must be met by all students seeking the baccalaureate degree. These include regulations concerning majors, minors, grade point average, upper division courses, and residence.

I. Essential Studies Program Requirements

An overview of the philosophy guiding the Essential Studies portion of the University’s graduation requirements is provided in the immediately preceding section of the catalog. The complete philosophy statement and the specific goals of the Essential Studies program are found at http://und.edu/academics/essential-studies/. The courses that can be used to satisfy the Essential Studies graduation requirements can be found at: http://und.edu/academics/essential-studies/approved-courses.cfm.

II. Upper Division Courses Required

A minimum of 36 semester credit hours must be completed in upper division courses by all undergraduate degree recipients. All courses numbered 300 and above and taken at a four-year institution are defined as upper division.

III. Majors

The specific requirements of a major or related fields concentration are determined by the department or program responsible for the major or concentration subject to approval by the University Curriculum Committee. A major requires at least 32 credit hours related to an academic area.

Students desiring to have more than one major listed on the transcript must have the written approval of the dean(s) of the college(s) offering the majors.

IV. Program Sub-plans

A sub-plan is a group of courses within an approved academic degree program or major which is identified in the institutional catalog. Sub-plans are either transcriptable or non-transcriptable. Transcriptable sub-plans (options, specialization, emphases, concentrations or tracks) require a minimum of 16 undergraduate distinct credit hours or a minimum of 9 graduate distinct credit hours.

V. Minors

Minors shall consist of a minimum of 20 semester hours of course work with the course distribution established by the appropriate department or departments with the approval of the University Curriculum Committee. Minors may consist of courses associated with a department or discipline (e.g. chemistry); a specialty within a department (office administration, etc.) or a collection of courses which cross disciplines (e.g. international studies). A minor is not required by the University but may be required in some programs for an undergraduate degree. A student may declare a minor in the office of the dean of the college in which the minor is offered.

VI. Program Certificate

A program certificate is a specialized course of study requiring at least 16 credit hours at the undergraduate level.

VII. Double Use of Courses

1. Courses within a major or required by a program may, at the same time, fulfill Essential Studies Requirements for the University. (There are a few exceptions to this general rule. These exceptions are stated under departmental requirements, for example under the Communication program.)

2. Courses may NOT generally be used, however, to count at the same time toward the total credits needed for 2 majors, 2 minors, or a major and a minor.

3. In certain cases courses may count toward a major (or minor) and, at the same time, fulfill “Extradepartmental Requirements” for another major or program. Consult college or departmental offices for more information,
VIII. Grade Point Average

To qualify for a degree a student must achieve a minimum 2.00 (C) average on all University work. For students with transfer work, it is required that the overall average (including transfer work) be 2.00 (C) and that the average work taken at the University of North Dakota be 2.00 (C). Some undergraduate colleges require higher averages. (See requirements under specific college information.)

All UND coursework applied to the major or minor must average 2.0 or above; all coursework applied to the major or minor including transfer work must also average 2.0 or above. Certain colleges or majors/minors may require a higher GPA.

IV. Residence Requirements

A candidate for the bachelor’s degree who enters with transfer credit must obtain from the University a minimum of 30 semester hours of institutional credit and 60 semester credits from a four-year college. Fifteen semester credits in the student’s major and four semester credits in the minor, if a minor is declared, must be institutional credit. Some colleges of the University may require more than 15 hours of institutional credit in the major. The last 30 credits for the bachelor’s degree ordinarily must be institutional credit.

Institutional Credit includes degree credit courses:
1. taken in residence;
2. taken through Continuing Education.

Credits earned by examination, e.g., Foreign Language Placement and Special Examination for Credit, do not count as Institutional Credit.

Exceptions to General Graduation Requirements

Any exception to the above general degree requirements must be requested by the student at least six weeks prior to his or her expected graduation date. Petitions must be initiated in the office of the student’s dean.

Formal Application for the Degree Sought

Candidates for degrees should make online application within the first four weeks of the semester in which the student expects to receive the degree. The application process is online at: apps.und.edu/graduationonline. Students applying for two or more degrees to be awarded simultaneously must apply separately for each degree and receive approval from each college granting the degrees.

Conferring of Additional Baccalaureate Degrees

Students who have majors falling under different degrees may be eligible for a second degree. Candidates for a second UND baccalaureate degree must complete a minimum of 155 hours (30 additional hours beyond the University minimum for a first baccalaureate degree). Each successive baccalaureate degree beyond that will add 30 hours to the minimum requirement. All college and major requirements for the second degree must also be fulfilled. At least one-half of the additional 30 hours must be institutional credit. A minimum of 15 semester credits of the major and a minimum of four semester credits of the minor, if declared, must be institutional credit.

Major Declaration Policy, Common Course Numbers, Special Exams

Major Declaration Policy

In order to progress toward the timely and successful completion of an undergraduate degree, it is in the best interest of students at the University of North Dakota to declare a major early in their academic career. During the semester in which a General Studies: Undeclared student will reach 45 undergraduate credit hours (typically the third semester), a Major Declaration notice will be added to the student’s To Do list in Campus Connection. In addition, the Student Success Center will use multiple means of communication and connect a student to resources to assist in exploring program of study options. This notification will prompt a student to take the necessary steps to move from General Studies: Undeclared, and begin working with an advisor in the program of study the student plans to pursue.

Upon reaching 60 credit hours in a General Studies: Undeclared status, a negative service indicator hold will be placed on a student’s account prohibiting registration for the following semester until a program of study other than General Studies: Undeclared is chosen. The Student Success Center will further assist the student through additional communication and contact to prompt major declaration. Once a major is declared, the negative service indicator hold will be removed by the Student Success Center, allowing the student to register for courses based on the intended program of study. A student who has reached 60 or more credit hours would be allowed to retain or move to General Studies: Undeclared status only with permission from the Student Success Center.

Common Course Numbers

All universities and colleges in the North Dakota University System (NDUS) have agreed on Common Course Numbers (CCNs) for many of the courses they have in common. A list of the common courses can be found on the North Dakota University System website at: www.ndus.edu/system (http://www.ndus.edu/system).

Special Examinations for Credit

A regularly enrolled student may apply to take “special” (challenge or validating) examinations to establish credit for approved University courses. Requests to take an examination must be made to the chair of the department offering the course. Approval of the department chair, the instructor of the course and the dean of the college offering the course(s) are required. A petition with the appropriate signatures must be submitted to the Office of the Registrar prior to examinations. A committee of three appointed by the chair of the department offering the course will administer and evaluate the examinations, a majority being necessary to award a grade. Special examinations must be searching and comprehensive. Grades of “Satisfactory” or “Unsatisfactory” will be recorded on the student’s permanent record upon recommendation of the committee, but will not be used to compute scholastic average.

The fee per credit hour for a validating or challenge examination is one-half the regular credit hour fee for the course to be challenged. Receipt of payment must be presented to the instructor prior to examination.

Students may apply to take challenge or validating examinations to establish credit in University of North Dakota courses that correspond to work taken at institutions that are not regionally accredited, or for courses in which they have superior preparation or knowledge gained through prior learning or independent study. These exams are offered for courses which have no equivalent CLEP subject exams. Students who have audited a course, or who have previously enrolled in a course and then dropped it, will not ordinarily be permitted to take a special examination in that course.

College-Level Examination Program

The University of North Dakota offers the opportunity to submit the results of CLEP for credit in most of the Subject Examinations.

CLEP Subject Examinations currently accepted by UND for transfer credits with minimum acceptable standard scores can be found at: www.ndus.edu/students/earn-credit-by-exam (http://www.ndus.edu/students/earn-credit-by-exam). Credit earned through CLEP Subject Exams may be used to fulfill University General Education requirements, to fulfill specific course requirements, or to be used as elective credits. As soon as they become available, new examinations will be reviewed by University departments to determine their suitability for credit at UND.

The following guidelines have been established for utilization of the Subject Examinations:

1. A CLEP Subject Examination may not be taken to establish credit for a course in which a student has earned credit in a higher level sequential course.

2. Regarding CLEP Subject Examinations which offer a maximum of six to eight credits, a student with previously earned credit in one semester of a two-semester sequence must petition the CLEP Advanced Placement Program at UND.
Committee for exception to this policy prior to taking the CLEP Subject Examination for the balance of the credit.

3. A Subject Examination may be repeated no sooner than six months after date of the last testing. Students should submit a petition to the UND CLEP Committee for permission to repeat an examination.

4. A Subject Examination may not be taken to establish credit in a subject in which the student has been enrolled, but from which he or she has withdrawn after the last day to add a course, until six months from the last class day of the term in which he/she was enrolled for the course.

5. A Subject Examination may not be used to establish credit in a subject which the student has previously failed. In addition, a Subject Exam may not be used to repeat a course.

6. A student wishing to have CLEP credit included within the last 30 hours toward a bachelor’s degree must have appropriate petitions approved by the CLEP Committee and the Administrative Procedures Committee, since the last 30 credits must be earned in residence at the University, and CLEP credit is considered as equivalent to credit earned at another institution. All CLEP testing is now computer based. UND uses the ACE Recommended Credit-Granting Score as a guide to determine whether credit is granted.

7. For a listing of approved examinations, required scores, and transfer equivalents, go to: www.ndus.edu/students/earn-credit-by-exam (http://www.ndus.edu/students/earn-credit-by-exam).

Foreign Language Placement & Credit Test

Students with a background in a foreign language which is currently taught in the Languages Department at UND may receive credit by taking a test in that language through the Languages Department. It is strongly recommended that students take this test during pre-registration or registration. Students who take it later than the end of their first semester in residence will need to see the Language Lab Director for the appropriate petition form, and will need to petition to establish eligibility. Students who are enrolled in a language course and wish to take the Foreign Language Placement & Credit Test in that language must take it during the first two weeks of the semester.

Credits earned through the Foreign Language Placement & Credit Test do not satisfy the World Cultures General Education Requirement. See University GER listing.

Credit earned through College Level Examination Program (CLEP) tests may be recognized by UND. See CLEP (p. 35) listing.

Students who have completed French, German, Latin, or Spanish Advanced Placement (AP) courses with appropriate scores may also receive credit. This credit is normally equivalent to Levels I and II in that language. See Advanced Placement (p. 35) listing.

Native speakers of a language other than English who wish to take classes in that language may enroll without special permission in any 400-level course, or in any 300-level course which emphasizes literary or cultural topics. Native speakers must obtain the permission of the department, however, to enroll in any 300-level course which emphasizes language instruction, or in any lower-division course. Incoming students whose native language (as indicated on their TOEFL exam) is one offered at UND should consult the Director of the Language Laboratory (M-306) about automatic waiver of the language placement examination.

Cooperative Education

Cooperative Education is an academic program that provides students with opportunities to both integrate and combine their course learning with practical, professional work experience in their chosen field of study. Cooperative Education experiences allow students to secure salaried, career-related work experiences under the supervision of both a sponsoring employer and the appropriate academic department, while at the same time receiving academic credit. The program is based on the belief that learning extends beyond the classroom and that the combination of course learning and practical work experience provides an innovative and comprehensive education.

Students spend from 3-9 months on Cooperative Education assignment. Academic credit is granted by the participating academic department through the student’s enrollment in the department’s course titled, Cooperative Education 397. For part-time coop where the student works a minimum of 20 hours per week, the student will enroll in Cooperative Education 397 for 1 academic credit but will be considered half-time for financial aid and enrollment reporting purposes. For full-time coop, where the student works full-time, usually a minimum of 40 hours per week, the student will enroll in 2 academic credits but will be considered full-time for financial aid and enrollment reporting purposes.

The Cooperative Education Program, a part of Career Services, is located in McCannel Hall, Room 280. For information, call 777-4105.

Registration

The academic year calendars giving the dates of registration appear at the beginning of the catalog. Details concerning the registration procedure are given in the Semester Information, which is available at: www.und.edu/academics/registrar. The University of North Dakota complies with NDUS Policy 402.1.2. for placement into Math and English. Students must be registered to attend a class. A student accepts responsibility for payment of tuition and fees when he/she registers in classes at the University of North Dakota.

Change of Registration

After a student has registered, he or she should consult with his or her advisor before changing the registration. Students should be aware that all drops after the first day of class could affect their ability to have financial aid in future term. The last day to drop a full-term course for all students is on the Friday four weeks preceding the last class day of each term. (See also Summer Sessions deadlines on the academic year catalog (p. 7).) Thereafter, a student may not cancel from individual courses but must carry them to completion.

The last day to drop a class of less than the full semester in length (a mini-class) is a day two-thirds of the duration of the class.

If a course is dropped after the first 10 calendar days of the semester, no indication of enrollment is made on the student’s permanent academic record. If a course is dropped after the first 10 calendar days of the semester, the enrollment is recorded on the student’s permanent academic record and a “W” is entered in the grade column. However, all courses for which the student is enrolled after the tenth day of the term will count toward their satisfactory progress for financial aid.

No change in registration involving addition of a new course or a change of sections is permitted after the tenth calendar day of instruction of the semester (except during Summer Session). Changes to or from credit to audit is the last day to add. Changes to or from S-U grading are permitted until the last day to drop the course. The specific deadlines for the various types of changes of registration are published in the Semester Information each semester at: www.und.edu/academics/registrar.

Verifying student participation for dropped courses, official withdrawals, and unofficial withdrawals:

Students who drop courses, officially withdraw, or unofficially withdraw will have their financial aid eligibility reviewed due to their change in enrollment. Federal regulations require that students who receive federal financial aid must attend or academically participate in the number of credits for which they received financial aid for.

A new requirement for faculty has been added to the grade roster program pursuant to Federal Financial Aid monitoring regulations that will affect any final grade roster in which a grade of F or U is assigned.

There are now 3 varieties of F and U grades:

1. A grade entered as F (or U) means that the student finished the course but earned a failing grade.
2. A grade entered as FNN (or UNN) means that the student never participated in the class and never dropped it and must therefore receive a failing grade.
3. A grade entered as FN (or UN) means that the student did participate in the class, but stopped attending/participating at some point. In this case, the system will require you to enter a date of last participation for the student, and will not let you change the status of the roster to “approved” unless you do so. Please keep this in mind for any classes where you will be entering a failing grade for any student who is failing because they stopped attending/participating.

Note that FN and FNN will print as a grade of F on the student’s transcript (and the UN and UNN will print as U), but the different types of F and U grades will remain on the roster record to allow Financial Aid to obtain “attendance” information that they are required to monitor.

Some examples of “attendance” or “attendance at an academically-related activity” include:

- Physical class attendance where there is an opportunity for direct interaction between instructor and students
- Submission of an academic assignment
- Taking an exam, completing an interactive tutorial, or participating in computer-assisted instruction
- Attending a study group that is assigned by the school
- Participation in an online discussion about academic matters
- Initiating contact with a faculty member to ask a question about the academic subject studied in the course

Please advise students to contact the Financial Aid Office before they drop a course or officially withdraw from the University as we can discuss how it may negatively impact their financial aid.

Instructor’s Drop Policy

An instructor may submit a list of students to be deleted from class roles who have neither attended class nor notified the instructor of withdrawal within the first five days from commencement of University instruction. The Registrar will delete from the class rolls the names of students received and will send a notice to each student dropped from a course in this manner.

Not all instructors follow this policy since it is not mandatory. Students, therefore, are strongly advised not to assume that they have been dropped from a course. Students should review their registration status in a course in question through Campus Connection.

Withdrawal from University

A student wishing to withdraw from the University before the end of a semester must complete a Cancellation/Withdrawal Form located at: und.edu/academics/registrar/forms.cfm. Questions regarding the process can be directed to the Office of the Registrar.

The last day a student may withdraw registration without grades, but with a “W,” is the Friday four weeks preceding the last class day of the term. (See also Summer Sessions deadlines (p. 7)). After that time a student should continue classes to completion. An exception to this rule is that a student may have his or her registration withdrawn without grades, but with a “W,” for cause (major mental or physical illness or other significant incapacity) providing both the student’s Academic Dean and the Associate Vice President for Student Services agree to this course of action. Please note: Any withdrawal within the first ten calendar days of the semester reflects on the transcript as “withdrawn” and the date. Anytime a student withdraws after the first ten calendar days of the semester, a “W” grade for each course, indicating the withdrawal, will appear on the student’s transcript. All courses in which the student was enrolled on the first day of the term will be considered when assessing satisfactory progress for financial aid purposes.

A student who leaves the University without obtaining an official withdrawal is given an “F” in all courses.

Student Load

Full time status is accorded to an undergraduate student enrolled in 12 semester hours in a Fall or Spring semester. A part-time student is enrolled in less than 12 semester hours.

For a member of the freshman class, 16 hours a semester is considered a normal schedule. Outside work or activities may necessitate a reduction of the student’s academic schedule.

For most undergraduate colleges from 15 to 17 hours of class work a week is the normal load. A student wishing to enroll in more than 21 semester hours, including collaborative registrations according to NDUS procedure 404, must obtain approval from his/her advisor and the dean of the college in which the student is enrolled.

The Grading System

At the close of a session or upon the completion of a course, each instructor reports a letter grade indicating the quality of a student’s work in the course. Grade points are assigned for each semester hour of credit earned, according to the following grading system:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Explanation</th>
<th>Grade Pts. Per Sem. Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Marked Excellence</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Superior</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Passing but low</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td>Not Reported</td>
<td></td>
</tr>
<tr>
<td>AU</td>
<td>Audit</td>
<td></td>
</tr>
<tr>
<td>WAU</td>
<td>Withdrawn from Audit</td>
<td></td>
</tr>
<tr>
<td>WV</td>
<td>Course Waived</td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>Satisfactory Progress</td>
<td></td>
</tr>
<tr>
<td>UP</td>
<td>Unsatisfactory Progress</td>
<td></td>
</tr>
</tbody>
</table>

Auditors

Students wishing to enroll in University classes as auditors must seek and receive the prior written consent of the instructor. They must also, at that time, learn from the instructor what will be expected of them or allowed as an auditor. The earliest date to add an audit is the first day of class. The regular deadline for adding a class will also be the deadline for all of the following:

1. adding a class as an audit:
2. changing from grade to audit; and
3. changing from audit to grade.

Auditors have no claim on the time or service of the instructor. Normally, auditors will be expected to attend, but not required to participate in the oral or written work of the class. If they are allowed to take examinations, the exams would normally not be graded. It is up to the instructor, however, to determine the appropriate requirements or restrictions for auditors for any given course. If students fulfill the expected requirements, their transcript will show no credit for the class, but a designation of “AU.” If they do not meet expectations, a grade of “WAU” will be entered on their transcript. Auditors are identified to the instructor on the official class list. An auditor may not later establish credit in that course by taking a special examination. The course must be repeated to earn credit. Audited courses do not count toward class load for financial aid or other purposes.

Incomplete Grades

It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student’s control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark “I,” Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor.
Incomplete grades will convert to a grade of “FI” if a grade or incomplete extension is not submitted by the instructor to the Office of the Registrar on or before the deadline written on the “Report of Incomplete Grade” form.

The instructor of the course and the dean of the college offering the course for undergraduates or the dean of the School of Graduate Studies for graduate students must approve and sign the “Report of Incomplete Grade” form for any extension of incomplete beyond the default date listed in the “UND Schedule of Courses.” An incomplete grade must be changed by 12 calendar months from the ending date of the class. It is the student’s responsibility to contact their instructor about an incomplete grade posted on the final grade report.

An “I” may be converted as indicated above but cannot be expunged from the record. Students may not register in courses in which they currently hold grades of incomplete, except for courses that allow repeated enrollment. A student will not be allowed to graduate with an unconverted incomplete grade on the academic record.

In Progress Grades

The School of Graduate Studies, Honors Program, or specially approved classes, may assign a grade of “SP,” Satisfactory Progress or “UP.” Unsatisfactory Progress to courses such as Honors Thesis (489), Thesis (998), Dissertation (999), Independent Study (997), ENGL 591 Readings for Ph.D. Comprehensive Examinations, Professional Exhibition (ART 599 Professional Exhibition), or Research (leading to the thesis or dissertation). The “SP” or the “UP” grade for these activities, which usually span several sessions, must remain on the record or may be replaced at the conclusion of the activity, usually a student’s final semester. Grades of “SP” or “UP” are not calculated into term or cumulative GPA values and may be expunged from the record upon submission of final grades in some cases.

Grade Changes

Submitted grades, except for grades of incomplete, are final and may only be changed to correct an error. Grades may not be changed by additional work or submitting additional materials. Students should report any error to their instructor within 90 days of receipt of the grade. The instructor must file a change of grade form to the Registrar signed by the instructor, the department chair, and the dean of the course. Reasons for the change must be fully explained and justified. Grade changes must be submitted to the Registrar’s Office no later than 12 calendar months from the ending date of the class. However, for graduating students, once your degree has been awarded, your record for that degree is frozen and changes can no longer be made.

S-U Grades

Grades of S or U rather than the traditional grades of A through F are used by the University under regulations specified. A grade of S grants credit toward graduation but does not affect a student’s grade point average except as outlined below in item number 4. A grade of U also does not affect the grade point average and does not grant credit toward graduation.

Elective S-U Enrollment

A student of sophomore, junior or senior standing (as determined by the Registrar) may elect to enroll in one or more courses per semester for S-U grading subject to the following regulations. Students with fewer than 24 completed credits may elect S-U grading only with the permission of their advisor and dean.

1. A maximum of 30 semester hours of credit of elected S-U grades may be counted toward his or her baccalaureate degree.
2. Students may not elect S-U grading for courses in their major. (This restriction does not apply to those courses that have only S-U grading.) In the event a student wishes to major in a field in which he/she has taken a required course for an S-U grade, the department, with the approval of the Academic Dean, may (a) accept the S-U grade, (b) select an additional class to substitute or (c) request the Registrar’s Office to change the S or U to the letter grade submitted by the instructor.

A student may take extra-departmental major requirements for an S-U grade with the approval of the major department chair and his/her Academic Dean.

Repeating a course by S-U registration will eliminate the effects of the earlier grade from a student’s grade point average if the achieved result is an S. Repetition, which results in a U, will leave the effects of the earlier grade intact.

Class rolls and grade sheets will not identify students who are enrolled for S-U grading. Grades of A, B, and C will be converted by the Office of the Registrar to a grade of S. Grades of D and F will be converted to U. Changes in registration to or from S-U grading may, with the approval of the advisor, be made up to the last day to drop the course.

Students who utilize the S-U grading system are cautioned that they may encounter difficulty in having such credit accepted or evaluated, should they attempt to transfer credit to another university, change majors, or make application for graduate or professional study.

Required S-U Courses

Some courses, as approved by the University Curriculum Committee, will be offered by S-U grading only. The restrictions on Elective S-U courses do not apply to these Required S-U courses. These courses may be taken in excess of the 30 hour limitation.

Repetition of Courses

Students generally may repeat courses to attempt to receive a better grade, but restrictions may apply. Individual colleges may limit the number of times that a course may be taken, and may not allow repeats of C or better grades. Examinations for credit, e.g., CLEP, AP, IB, DSS and Foreign Language Placement and Credit Test, may not repeat course grades.

If a course repetition is taken for traditional A through F letter grading, the last grade achieved in the course will be used in calculating the student’s grade point average. Repeating an approved course with S-U grading will eliminate the effects of previous credits from the student’s GPA if the achieved result is an S, but repetition which results in a U will leave the effects of the earlier grade intact.

Please note: New Federal regulations may not permit financial aid to be used to pay for a repeat of an already passed course. Please contact the Financial Aid Office regarding questions.

While courses may be taken again after a student has graduated, these will not serve to repeat older grades: the older grades will still be counted in the Grade Point Average.

If a student has previously passed the course twice with a “D” or higher, that course will not be counted for federal financial aid.

Raising a “D” Grade

To raise a D grade, a student may have the alternative of retaking a final examination at the time of the first regularly scheduled final examination in the subject if it meets with the approval of the department and dean of the course and the student’s advisor, except in the School of Graduate Studies, School of Law, the School of Medicine and Health Sciences, and the College of Nursing and Professional Disciplines. If a student decides to retake the final examination, approval must be obtained from the instructor and department chair of the course and the dean of the college offering the course. No re-examination will be given except at the time of the regularly scheduled examinations at the end of each semester.

Grade Forgiveness

Currently enrolled undergraduate students who have interrupted their college/university education for a period of seven years or more, may petition to exclude all previous grades from GPA calculations. The student may not
Even in situations where an instructor might excuse a class absence, e.g., that policy to students during the first week of class in the course syllabus. It is the responsibility of the instructor to communicate clearly expected of all students. If attendance and/or participation are required and will Attendance and participation in class activities are considered integral parts of University Attendance Policy and A student who is in debt to the University shall not be permitted to early register University of North Dakota does not issue nor certify copies of transcripts from A request for a transcript of credits by a student who is in debt to the University is directed to the Office of the Registrar. Transcripts of Academic Records Official transcript requests must now be submitted via the web. The web service is available 24/7 and provides online tracking and messaging. All transcript ordering information, including a link to the website, is located at: www.und.edu/dept/registrar/trans/requestonline. The cost per transcript is $12. There is an additional charge for services such as Federal Express delivery. Each transcript includes the student’s entire academic record to date and current academic status. Partial transcripts are not issued. Questions should be directed to the Office of the Registrar. A request for a transcript of credits by a student who is in debt to the University will not be honored until the indebtedness has been paid. A transcript covering a student’s previous secondary and post-secondary education that has been submitted to the University as a requirement for admission becomes part of the official file and cannot be returned to the student. Any student who desires transcripts of work earned elsewhere must order official transcripts from the institution at which the work was taken. The University of North Dakota does not issue nor certify copies of transcripts from other institutions. Students in Debt to the University A student who is in debt to the University shall not be permitted to early register or register in the University and shall not be entitled to receive a transcript of credits or a diploma until the indebtedness has been paid in full. University Attendance Policy and Procedure Attendance and participation in class activities are considered integral parts of a university education. It is the University policy that attendance in classes is expected of all students. If attendance and/or participation are required and will impact grading, it is the responsibility of the instructor to communicate clearly that policy to students during the first week of class in the course syllabus. Even in situations where an instructor might excuse a class absence, e.g., severe medical situations, family emergencies, military service, or authorized University activities, it is the responsibility of the student, whenever possible, to inform the instructor ahead of time. Final Examination Policy An examination is held at the end of most courses according to the published examination schedule. Alternate evaluation methods and schedules may be used when recommended by the departmental faculty and approved by the dean of the college offering the course. Any change in time from the published schedule requires the recommendation of the chairperson of the department and approval of the dean of the college offering the course. Any student who would be disadvantaged by such a change should report this in advance to the dean of the college offering the course, who will ensure that satisfactory alternate arrangements will be made by the instructor. Final exams for all courses, on-campus and semester based online, will conclude on or prior to the end of the final exam period. No final exams shall extend beyond the final exam period. A student who is absent from a regularly scheduled examination without an excuse considered valid by the instructor is normally given an F for the course. If the excuse is valid, the policy on incompletes will apply. No undergraduate student should be obliged to write three or more finals on the same day. If the student has three or more finals scheduled the same day, the student wishing an accommodation regarding final exams should contact his/her instructors to establish a mutually acceptable time to reschedule one or more of the exams. Any student request for the rescheduled final exam must be presented to the instructor before the end of the tenth week of the semester, otherwise, the student’s rescheduling right is forfeited. If an accommodation cannot be reached, he or she should contact the department chair(s) to find a mutually agreeable time. If no agreement is reached, the appropriate dean(s) should be contacted. The final appeal, if no mutually convenient time has been found, will be to the Vice President of Academic Affairs. Undergraduate Probation, Suspension and Dismissal Policy Academic Probation. Students at the University of North Dakota are expected to make progress toward attaining their degrees. Students who have earned fewer than 90 total hours will be considered in Good Academic Standing if they maintain a UND Grade Point Average (GPA) of C (2.00) or higher. Students who have earned 90 or more total hours will be in Good Academic Standing only with a 2.00 or higher GPA on both UND and cumulative hours. Students who do not maintain minimum academic requirements will, at the end of the fall, spring, or summer term in which they fail to meet minimum standards, be placed on Academic Probation. Students on Academic Probation may remove this status by attaining Academic Good Standing. Students will be continued on Academic Probation if they earn at least a 2.00 term GPA at the end of the semester of probation. Suspension. A student on Academic Probation who earns less than a 2.00 term GPA at the end of the semester of probation is considered not to be making academic progress and will be suspended. A suspended student may apply to return to the University after one semester’s absence. In order to return to UND, all suspended students must seek reinstatement from the Dean of the college in which they intend to enroll and readmission from the Office of the Registrar. If reinstatement is granted, the student will return to UND on probationary status. In addition, Deans may specify enrollment stipulations at the time of reinstatement. A request for reinstatement after suspension must be made at least 30 days prior to the semester in which the student seeks to return. Under extenuating circumstances, suspended students may seek immediate reinstatement from the Dean of the college in which they intend to enroll without leaving the University for one academic semester. A request for immediate reinstatement must be made by the Monday, one week prior to the first week of school, of the semester in which the student seeks to return. If the Dean does not reinstate the student after suspension, (whether a request for immediate reinstatement is made or the student sits out a term) the student may appeal the Dean’s decision. The appeal is requested through the University Senate Student Academic Standards Committee. In all cases, if requesting reinstatement, suspended students must provide evidence of academic potential and a plan for significant academic success.
Students are eligible to request reinstatement from suspension once within the duration of their undergraduate career at the University.

Separate from the request for reinstatement process following suspension, if the student feels the suspension has occurred based on circumstances beyond the student’s control, a request to appeal the suspension may be made. The request for an appeal following suspension must be made within 30 days to the University Senate Student Academic Standards Committee.

**Dismissal:** After the first suspension, failure to achieve minimum academic standards will result in the student being dismissed from the University. Dismissed students may apply to return to the University after a minimum of one year separation from the Institution along with evidence of academic potential and a plan for significant academic success.

An application for readmission after dismissal must be made at least 30 days prior to the beginning of the semester in which the student seeks to return. The request for readmission is acted upon by the University Senate Student Academic Standards Committee. If readmission is granted, the student will return to UND on probationary status. Students are eligible to request readmission from dismissal once within the duration of their undergraduate career at the University.

Separate from the request for readmission following dismissal, if the student feels the dismissal was as a result beyond the student’s control, a request to appeal the dismissal may be made. The request for an appeal following dismissal must be made within 30 days to the University Senate Student Academic Standards Committee.

Suspension and dismissal are permanently recorded on the student’s transcript. (NOTE: It is possible to be in Good Academic Standing at the University, and, yet not to be in Good Academic Standing in certain University programs which require a GPA higher than 2.00.)

**Conduct in General**

A student is expected to show, both within and outside of the University, respect for law and order, personal honor, and the rights of others. To further strengthen the sense of community at the University of North Dakota, we affirm the following:

1. That everyone be allowed to work, learn, and live in a safe, caring environment;
2. That everyone learn about, understand, appreciate, and respect varied cultures;
3. That everyone matters;
4. That all individuals be respected and treated with dignity and civility;
5. That everyone continue to share in the responsibility of making UND a better place.

Within the University, the student is subject to specific policies, rules and regulations promulgated by student governing groups, student-faculty committees, University Senate and the State Board of Higher Education. The student is subject to civil law and civil authority.

The Code of Student Life is available at: http://und.edu/code-of-student-life/. It outlines the rights and responsibilities and expected levels of conduct of citizens in the University community. The purpose of the rules outlined is to prevent abuse of the rights of others and to maintain an atmosphere in the University community appropriate for an institution of higher education. Materials included will be helpful to student organizations and to members of the University community to gain a better understanding of responsibilities of various boards and committees, and to understand student rights and responsibilities. Appendix B in the Code covers academic concerns (grievances and standards) and Section III covers student conduct regulations and procedures.

The Code of Student Life is published annually. Interpretation of sections within the Code may be requested by contacting the Office of Student Rights & Responsibilities, the Vice President for Student Affairs, or through direct consultation with the Student Policy Committee.

**Scholastic Honesty**

Students are expected to maintain scholastic honesty. Scholastic dishonesty includes but is not limited to cheating on a test, plagiarism, and collusion.

1. Cheating on a test includes, but is not restricted to:
   a. Copying from another student’s test.
   b. Possessing or using material during a test not authorized by the person giving the test.
   c. Collaborating with or seeking aid from another student during a test without authority.
   d. Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or in part the contents of an unadministered test.
   e. Substituting for another student or permitting another student to substitute for oneself to take a test.
   f. Bribing another person to obtain an unadministered test or information about an unadministered test.
2. Plagiarism means the appropriation, buying, receiving as a gift, or obtaining by any means another person’s work and the unacknowledged submission or incorporation of it in one’s own work. This includes appropriation of another person’s work by the use of computers or any other electronic means.
3. Collusion means the unauthorized collaboration with another person in preparing written work offered for credit.

Instructors choosing to treat a case of scholastic dishonesty as a scholastic matter have the authority to decide how the incident of dishonesty will affect the student’s grade in the course. If, before the drop date, an instructor is considering such action (or still investigating a possible case of dishonesty), the instructor may, with the concurrence of the dean of the course, place a hold on the student’s registration to prevent the student dropping the course. If the student has already dropped the course, the dean of the course may void that drop and have the Registrar re-enroll the student in the class.

For detailed policy statements and procedures dealing with scholastic dishonesty, see the Code of Student Life, Appendix IIIa.

**Academic Honors**

**President’s Honor Roll**

At the end of each semester, a list of undergraduate honor students is published and designated as the President’s Honor Roll. To qualify, a student must have a cumulative UND grade point average of 3.80 or higher. The student must also have earned a minimum of 24 semester hours at UND and have completed a minimum of 12 hours at the close of the semester, eight of which must be for traditional letter grades. The President’s Honor Roll is noted on the student’s official transcript.

**Dean’s List**

The Dean’s List, published at the end of each semester, contains the names of students who are ranked in the top 15 percent of their college, based on the grade point average earned by students in UND coursework for the semester. The students must have completed a minimum of 12 semester hours at the close of the semester, eight of which must be for traditional letter grades.

**General Honors**

Candidates for honors with their baccalaureate degree must have earned at least 50 graded hours at UND. Honors will be awarded on the basis of the student’s UND grade point average.

<table>
<thead>
<tr>
<th>Honor</th>
<th>GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cum laude</td>
<td>3.5</td>
</tr>
<tr>
<td>Magna cum laude</td>
<td>3.7</td>
</tr>
<tr>
<td>Summa cum laude</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Honors awards for the commencement ceremony and for publication purposes are made on the basis of UND GPA at the end of the previous semester. Actual
honors will be based on the GPA of all completed work at the time the degree is granted.
Undergraduate Programs and Courses

In the menu to the left, is an alphabetical list of undergraduate programs and courses.

The University publishes electronically an official Schedule of Courses before the beginning of each academic term. It lists the class period, building, and room assigned to each course offered that semester or summer session.

Enrollment Restrictions

Enrollment in some University of North Dakota classes is restricted to students who have been admitted into specific major concentrations, who have achieved specific classification status, or who have completed course prerequisites. In some high demand areas, not all students who request a particular course may be admitted in a given semester because of staffing or other University limitations. Generally, the University registers undergraduate students in order of their classification; nevertheless, the University does not guarantee that a student will be able to enroll in a specific course during any given semester. Students must be registered to attend a class session.

Course Numbers

Courses numbered in the 100s are intended primarily for freshmen; in the 200s for sophomores; in the 300s for juniors; in the 400s for seniors and in the 500s for graduates.

The numbers 199, 299, 399 and 499 are reserved for Honors Program Courses.

Credit

Academic units are expressed in terms of semester credit hours at the University of North Dakota. For face-to-face courses, one semester credit hours represents one 50-minute class period (lecture or structured student/faculty interaction) or 2-3 hours of laboratory session for each week of the semester.

For online or distance courses, UND academic units are assigned according to the classification of the distance course:

- Type 1: Distance course sections taught synchronously with face-to-face sections with equivalent student learning objectives and expectations for student effort – The distance section is assigned the same credit hours as the face-to-face section.
- Type 2: Distance course sections taught asynchronously with face-to-face sections with equivalent student learning objectives and expectations for student effort – The distance section is assigned the same credit hours as the face-to-face section.
- Type 3: Distance courses not classified as Type 1 or 2 that share equivalent student learning objectives and expectations for student effort as face-to-face sections of the course at UND – The distance section is assigned the same credit hours as the face-to-face section.
- Type 4: Distance courses not classified as Type 1 or 2 that do not have corresponding face-to-face sections at UND for comparison – The department or unit providing the course must document the expected level of student effort, expected student/faculty interactions, course assessment plan, and student learning objectives for the course. This information will be reviewed by the appropriate Department, College/School, and University curriculum committees for assignment of appropriate credit hours.

Undergraduate Student Classification

- Freshman: 0-23 credits completed
- Sophomore: 24-59 credits completed
- Junior: 60-89 credits completed
- Senior: 90+ credits

Frequency of Offerings

The following symbols at the end of the course description indicate when and how often a class is usually available for registration.

- F usually every Fall semester
- S usually every Spring semester
- SS usually every Summer session
- F/2 usually every other Fall semester
- S/2 usually every other Spring semester

Accountancy (Acct)

http://www.business.und.edu/undergraduate/accounting

Altepeter, Byars, Campbell (Chair), de Magalhaes, Dosch, Ellingson, Gerszewski, Harmeson, Li, Mocadlo, Notbohm

College of Business and Public Administration

The Department of Accountancy has been preparing individuals for careers in business, including professional accounting, since 1927, and its faculty were instrumental in establishing the North Dakota Society of Certified Public Accountants. Department Faculty have a long-standing tradition of interaction with a wide range of accounting professionals.

Professional accountants face a variety of challenges and opportunities in their careers. To achieve success as a professional accountant, individuals must have a sound foundation in the liberal arts and sciences, a broad general understanding of business, a solid technical base in accounting, and a well developed ability to communicate in oral and written form. UND’s accounting programs provide the range of experience and knowledge needed for success as a professional accountant.

Mission Statement

The mission of the Department of Accountancy is to prepare individuals for professional careers in accounting and business.

Values Statement

Faculty value:

- High quality teaching, scholarship and professional and public service;
- Relevance and innovation in curriculum, instructional methods, scholarship and professional and public service;
- Good relationships with our alumni and recruiters;
- Interaction with the profession and community;
- High standards of professional and ethical conduct;
- A climate that fosters continuous improvement.

Vision Statement

Faculty see a future where:

- UND’s Accountancy program is recognized by employers and the general public as the best in the region. When people in the region think of accounting, they will think of UND;
- The Accountancy faculty are leaders in the College of Business and Public Administration, the University of North Dakota, and the community of accounting professionals.

Programs

Accountancy faculty offer two programs — the Bachelor of Accountancy (B.Acc.) and the Bachelor of Business Administration with a major in Managerial Finance and Accounting (B.B.A.), offered jointly with the Department of Economics and Finance. The B.Acc. program is designed primarily for students interested in becoming Certified Public Accountants (CPA). The CPA is a national designation that requires passage of a qualifying
examination. The requirements to sit for the CPA examination are governed by individual states (more about the CPA examination below).

The B.B.A., a joint program in finance and accounting, provides some flexibility for students to tailor their programs of study. As such, it is designed primarily for individuals interested in becoming a Certified Management Accountant (CMA) and/or pursuing careers in financial management. The CMA is a designation that requires successful completion of a national examination. Electives offer students in the B.B.A. program the option to emphasize either managerial finance or corporate accounting.

The Certified Public Accountant (CPA) Examination

While the American Institute of CPAs writes the CPA examination, each state is responsible for establishing the requirements to use the CPA designation. According to North Dakota law and rules of the North Dakota State Board of Accountancy, individuals are currently eligible to sit for the Uniform Certified Public Accountant Examination with a bachelor’s degree that includes at least 24 hours of accounting beyond Elements, 24 hours of business courses, and at least 150 semester hours of college courses.

The B.Acc. program meets the current North Dakota CPA examination eligibility requirements for accounting and business courses, however, satisfying the B.Acc. program requirements alone does not require 150 semester hours. Students interested in becoming CPAs are encouraged to consider opportunities for obtaining additional credits necessary to meet the 150 semester hour requirement by pursuing a minor, a second major, or graduate studies - including the Master of Accountancy combined program.

The Certified Managerial Accountant (CMA) Examination

The Institute of Management Accountants (IMA) establishes the standards or criteria for achieving the CMA designation. The eligibility requirements for taking the CMA examination require a Bachelor’s degree, and there is no requirement for additional credit hours. In comparison to the CPA examination, the CMA examination concentrates more heavily on corporate accounting, financial analysis and decision making.

B.B.A. with Major in Managerial Finance and Accounting

Required 127 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. College of Business and Public Administration Requirements (see BPA listing) and including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ACCT 201</td>
<td>Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
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<tr>
<td>ISBC 117</td>
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<td>1</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303</td>
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<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>MKRT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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</table>

Select one of the following:

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<thead>
<tr>
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<tbody>
<tr>
<td>ANTH 171</td>
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<td>3</td>
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<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
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</tbody>
</table>

Total Credits | 55 |

III. The following Major Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>ACCT 218</td>
<td>Advanced Spreadsheet Applications</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 301</td>
<td>Intermediate Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; ACCT 302</td>
<td>Intermediate Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 309</td>
<td>Accounting Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 316</td>
<td>Business Law II</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 320</td>
<td>Cost Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 401</td>
<td>Advanced Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 405</td>
<td>Assurance Services</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 411</td>
<td>Business Income Taxation</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 450</td>
<td>Contemporary Issues in Accounting</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 312</td>
<td>Fund Accounting</td>
<td>6</td>
</tr>
<tr>
<td>ACCT 403</td>
<td>Contemporary Accounting Theory</td>
<td></td>
</tr>
<tr>
<td>ACCT 406</td>
<td>Independent Assurance</td>
<td></td>
</tr>
<tr>
<td>ACCT 410</td>
<td>Federal Individual Income Tax</td>
<td></td>
</tr>
<tr>
<td>ACCT 412</td>
<td>Advanced Tax</td>
<td></td>
</tr>
<tr>
<td>ACCT 416</td>
<td>Advanced Business Law</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits | 36 |

IV. Students must complete at least 90 semester hours of non-accounting courses. ACCT 218 Advanced Spreadsheet Applications and business law courses are not considered accounting courses for this requirement.

B.B.A. with Major in Managerial Finance and Accounting

Required 127 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. College of Business and Public Administration Requirements (see BPA listing) and including:

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</tr>
</tbody>
</table>
Courses

**ACCT 200. Elements of Accounting I. 3 Credits.**
Basic principles of the complete accounting cycle. F.S.

**ACCT 201. Elements of Accounting II. 3 Credits.**
Special emphasis on partnership, corporate accounting, and the uses of accounting information by managers. Prerequisite: ACCT 200 or ACCT 275. F.S.

**ACCT 218. Advanced Spreadsheet Applications. 3 Credits.**
Advanced techniques in computer spreadsheet applications. Prerequisite: ISBC 117. Prerequisite or Corequisite: ACCT 201. F.S.

**ACCT 275. Accounting for Pre-MBA. 3 Credits.**
No credit allowed to students who have completed ACCT 201. Financial and managerial accounting concepts and practices oriented towards the decision maker. F.S.

**ACCT 301. Intermediate Accounting I. 3 Credits.**
Concepts, time value of money, current assets, current liabilities, plant and equipment, and intangibles. Prerequisite: ACCT 201. Prerequisite or Corequisite: ACCT 218; Sophomore, Junior or Senior Standing; declared and pre-CoBPA majors only. F.S.

**ACCT 302. Intermediate Accounting II. 3 Credits.**
Corporations, long-term liabilities, investments, statement analysis, and cash flow statement. Prerequisites: ACCT 301 with a grade of "C" or better or permission of the Department Chair and Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 309. Accounting Information Systems. 3 Credits.**
The application of systems design and use from the accountant's perspective. Coverage includes computerized and manual accounting systems, elements of internal control, flowcharting, and the interface of accounting and management information systems. Prerequisites: ACCT 301 and Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 312. Fund Accounting. 3 Credits.**
Financial accounting, control, and reporting for governmental and not-for-profit entities. Prerequisites: ACCT 201 and ACCT 218; Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 315. Business Law I. 3 Credits.**
The legal environment of business, governmental regulation, contracts, and property. Prerequisite: Sophomore, Junior or Senior Standing. Prerequisites or Corequisites: ACCT 201 and ECON 202; minimum total of 50 credit hours; declared and pre-CoBPA majors only. F.S.

**ACCT 316. Business Law II. 3 Credits.**
Commercial paper, secured transactions, business organizations, and liability of professionals. Prerequisites: ACCT 315; Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 320. Cost Accounting. 3 Credits.**
Principles and techniques used to account for and analyze costs incurred to produce products or services. Prerequisite: ACCT 201. Prerequisites or Corequisites: ACCT 218; Sophomore, Junior or Senior Standing; declared and pre-CoBPA majors only. F.S.

**ACCT 380. International Accounting. 3 Credits.**
Topics include comparative accounting systems, environmental influences on accounting, international financial statement analysis, foreign currency transactions, international standards harmonization, international taxation, transfer pricing, and multinational performance evaluation. Prerequisites: ACCT 201; Junior or Senior Standing; declared CoBPA majors only. S.

**ACCT 397. Cooperative Education. 1-2 Credits.**
on the job compensated cooperative work experience in various areas of accounting. Prerequisites: ACCT 301, ACCT 320, minimum GPA of 2.70, and the approval of the Accounting Co-operative/Internship Coordinator. Repeatable to 12 credits. S/U grading. F.S.S.S.

**ACCT 401. Advanced Accounting. 3 Credits.**
Special problems in accounting including consolidated statements, partnerships, and foreign exchange. Prerequisites: ACCT 302; Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 403. Contemporary Accounting Theory. 3 Credits.**
A study of the emerging issues and the problems facing the accounting profession with special emphasis on the authoritative pronouncements as designated by the American Institute of CPAs and the Financial Accounting Standards Board. S/U grading not allowed. Prerequisite or Corequisite: ACCT 401 or consent of instructor; declared CoBPA majors only. F.S.

**ACCT 405. Assurance Services. 3 Credits.**
Explores methods of improving the quality of information or its context for decision makers. Examples include assurances on the reliability of financial statements, the processes and controls used to manage and operate businesses, assertions and agreements made to third parties, and regulatory compliance. Prerequisites: ACCT 302, ACCT 309, ECON 210; Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 406. Independent Assurance. 3 Credits.**
Auditing and assurance theory as applied by independent accountants. Prerequisites: ACCT 405 or consent of instructor; declared CoBPA majors only. S.

**ACCT 410. Federal Individual Income Tax. 3 Credits.**
Federal income tax relating to individuals to include the more complex tax situations. A computerized individual income tax preparation is used as a part of the course. Prerequisites: ACCT 201; Junior or Senior Standing; declared CoBPA majors only. F.S.

**ACCT 411. Business Income Taxation. 3 Credits.**
Federal income tax relating to corporations and partnerships. Introduction to estate and gift tax and fiduciary income tax. Prerequisites: ACCT 302; Senior Standing; declared CoBPA majors only. F.S.

**ACCT 412. Advanced Tax. 3 Credits.**
Unified transfer tax, trusts and estates, other contemporary topics as appropriate, and techniques of tax research. Prerequisites: Consent of the instructor, open to declared CoBPA majors only. S.

**ACCT 416. Advanced Business Law. 3 Credits.**
Advanced topics and contemporary issues in business law including ethics, legal representation in business, and the impact of selected governmental regulations on businesses. Prerequisites: ACCT 315 and Senior Standing; declared CoBPA majors only. F.S.

**ACCT 450. Contemporary Issues in Accounting. 3 Credits.**
A critical analysis of contemporary issues in accounting. Written and oral presentations are required. Prerequisites: ACCT 302; Senior Standing; declared CoBPA majors only. Prerequisite or Corequisite: ACCT 405.

**ACCT 494. The Literature of Accounting. 1-3 Credits.**
Directed studies in the recognized journals, periodicals, and professional publications of the field. Prerequisites: Consent of the instructor, open to declared CoBPA majors only. Repeatable to 6 credits.

**ACCT 495. Special Topics in Accounting. 1-3 Credits.**
Specially arranged courses/seminars. Topics will vary. Courses will offer specialized knowledge in a specific area related to accounting. Prerequisites: Minimum of junior standing and approval of the instructor or department chair. Repeatable to 12 credits. On demand.

**ACCT 497. Accounting Internship. 1-12 Credits.**
On the job compensated internship work experience in various areas of accounting. Prerequisites: ACCT 301 or ACCT 320; overall minimum GPA of 2.70; approval of the Accounting Co-operative/Internship Coordinator; the job responsibilities of the student must be accounting related in order to receive accounting internship credit. Repeatable to 12 credits. S/U grading. F.S.S.S.
Aerospace Studies (AS)

http://www.ndsu.edu/majors/airforce/

UND students may participate in the Air Force Reserve Officer Training Corps program through an agreement between UND, North Dakota State University, and the Air Force. The purpose of this program is to enable qualified students (undergraduate and graduate) to become commissioned officers in the United States Air Force. Upon completion of the program and graduation from UND, students are commissioned as second lieutenants in the United States Air Force.

The program is conducted by North Dakota State University faculty on the UND campus. Students interested in participating in the program should contact:
Air Force ROTC Detachment 610, 255 Centennial Drive, Armory Building, Room 2, Stop 8360, University of North Dakota, Grand Forks ND 58202, (701) 777-0437.

The program is conducted in two phases: the General Military Course for first year students and sophomores, and the Professional Officer Course for juniors and seniors. Each student must register for the appropriate leadership laboratory course (AS 210 Leadership Laboratory for freshman and sophomore or AS 410 Leadership Laboratory for juniors and seniors) during each term. Students must complete a field training course before entry into the Professional Officer Course.

General Military Course (GMC)
The four-year program begins with the General Military Course.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 111</td>
<td>The Foundations of the United States Air Force I</td>
<td>1</td>
</tr>
<tr>
<td>AS 112</td>
<td>The Foundations of the United States Air Force II</td>
<td>1</td>
</tr>
<tr>
<td>AS 211</td>
<td>The Evolution of USAF Air and Space Power I</td>
<td>1</td>
</tr>
<tr>
<td>AS 212</td>
<td>The Evolution of USAF Air and Space Power II</td>
<td>1</td>
</tr>
</tbody>
</table>

The GMC covers the mission and structure of the Air Force, examines life in the Air Force, and includes the study of strategy, doctrine, and missions of aerospace power from balloons to the space age. Instruction is provided in Air Force career opportunities, educational benefits, and life and work as an Air Force officer.

Field Training
Air Force ROTC Field Training is offered during the summer months at Maxwell AFB, Alabama. Students in the four-year program participate in four weeks of field training during the summer after their sophomore year.

The major areas of study in the four-week field training program include junior officer training, aircraft and aircrew indoctrination, survival training, base functions, the Air Force environment, and physical training.

Leadership Laboratory
(AS 210 Leadership Laboratory, 1 credit and AS 410 Leadership Laboratory, 1 credit; repeatable). Instruction is conducted within the framework of a cadet organization and includes a progression of experiences designed to develop each student's leadership potential. Leadership laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities in the Air Force, and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical and supervised laboratory, which can include field trips to Air Force installations throughout the United States.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>AS 410</td>
<td>Leadership Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

AS 210 Leadership Laboratory is a corequisite of

<table>
<thead>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 111</td>
<td>The Foundations of the United States Air Force I</td>
<td>1</td>
</tr>
<tr>
<td>AS 112</td>
<td>The Foundations of the United States Air Force II</td>
<td>1</td>
</tr>
<tr>
<td>AS 211</td>
<td>The Evolution of USAF Air and Space Power I</td>
<td>1</td>
</tr>
<tr>
<td>AS 212</td>
<td>The Evolution of USAF Air and Space Power II</td>
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</table>

AS 410 Leadership Laboratory is a corequisite of

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 321</td>
<td>Air Force Leadership Studies I</td>
<td>3</td>
</tr>
</tbody>
</table>

Professional Officer Course (POC)
The Professional Officer course (below) taken during the student’s junior and senior years, concentrates on four main themes: communication skills, national security studies, and the principles and practices of management and leadership in the U.S. Air Force.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 321</td>
<td>Air Force Leadership Studies I</td>
<td>3</td>
</tr>
<tr>
<td>AS 322</td>
<td>Air Force Leadership Studies II</td>
<td>3</td>
</tr>
<tr>
<td>AS 441</td>
<td>National Security Affairs and Preparation for Active Duty I</td>
<td>3</td>
</tr>
<tr>
<td>AS 442</td>
<td>National Security Affairs and Preparation for Active Duty II</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses

**AS 110. Air Force ROTC Fitness. 1 Credit.**
Introduction to various AFROTC team sports. Promotes benefits of being physically fit and maintaining Air Force fitness standards. Repeatable. Repeatable. F.S.

**AS 111. The Foundations of the United States Air Force I. 1 Credit.**
Survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force. Corequisite: AS 210. F.

**AS 112. The Foundations of the United States Air Force II. 1 Credit.**
Continuation of AS 111. Provides an overview of the basic characteristics, missions, and organization of the Air Force. Corequisite: AS 210 or AS 410. S.

**AS 210. Leadership Laboratory. 1 Credit.**

**AS 211. The Evolution of USAF Air and Space Power I. 1 Credit.**
Introduction to Air Force heritage and leaders, Quality Air Force concepts, ethics and values, leadership, group leadership problems, and the application of communication skills. Corequisite: AS 210. F.

**AS 212. The Evolution of USAF Air and Space Power II. 1 Credit.**
Continuation of AS 211. Includes an introduction to Air Force heritage and leaders, Quality Air Force concepts, ethics and values, leadership, group leadership problems, and the application of communication skills. Prepares cadets for field training. Corequisite: AS 210. S.

**AS 321. Air Force Leadership Studies I. 3 Credits.**
Introduction to management within the USAF, emphasizing communication skills (in both oral and written Air Force formats) and interpersonal skills. Corequisite: AS 410. F.

**AS 322. Air Force Leadership Studies II. 3 Credits.**
Study of leadership from the military perspective emphasizing situational leadership and contemporary issues including change management and professional ethics. Case studies are used to illustrate leadership concepts. Officer professional development topics are discussed. Corequisite: AS 410. S.

**AS 410. Leadership Laboratory. 1 Credit.**
Development of leadership skills in a practical, supervised laboratory. Students must instruct, supervise, and lead junior cadets participating in AS 210, and perform high level management functions within the cadet corps organization. Repeatable. Repeatable. S/U grading. F.S.

**AS 441. National Security Affairs and Preparation for Active Duty I. 3 Credits.**
A study of the national security process, regional studies, advanced leadership ethics and Air Force doctrine. Topics include the military as a profession, officer leadership, military justice, civilian control of the military, and current issues. Application of communication skills is included. Corequisite: AS 410. F.
American Indian Studies (IS)

Hans and Rundquist (Chair)

http://arts-sciences.und.edu/american-indian-studies/

The American Indian Studies curriculum at the University of North Dakota has been established to meet needs both on the campus and throughout the state. The major and minor, combined with other subject matter concentrations, are intended to provide:

1. a more complete understanding of American Indian history and culture;
2. practical experiences in American Indian communities;
3. an understanding of Native communities and cultures within a diverse, global environment;
4. a basis for employment in either reservation or non-reservation settings; and
5. background for graduate work in American Indian Studies and related programs (history, anthropology, American Studies, etc.).

The degree of Bachelor of Arts is offered through the College of Arts and Sciences. For the greater University community, the courses in American Indian Studies, together with the research conducted or sponsored by the Department, provide an expanded approach to the study of American history, diversity and cultures.

The greatest purpose of the department is to provide education to the broader community about Native experiences and realities. The department welcomes all students, Native and non-Native, to critically engage these issues. The department prepares its graduates for lifelong careers of learning and thinking, for living in and working with, in, and around Native American communities, and for a better understanding of cultures, histories, literatures, laws, and traditions in the United States and beyond, in their local and global expressions.

College of Arts and Sciences

B.A. with Major in American Indian Studies

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

A. 36 credit hours in the Major

Of these, the following courses are required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 230</td>
<td>Approaches to Native Cultures</td>
<td>3</td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>IS 395</td>
<td>Ethnohistory of North America</td>
<td>3</td>
</tr>
<tr>
<td>or IS 354</td>
<td>Dynamics of Conquest and Resistance</td>
<td>3</td>
</tr>
<tr>
<td>IS 410</td>
<td>Indigenous Identities</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>Electives from the American Indian Studies curriculum in accordance with advisor recommendations</td>
<td>24</td>
</tr>
</tbody>
</table>

The maximum combined credit hours counting toward the accumulation of credits for the major in IS 430, 492, and 494 is nine. Any student taking more than a combined six credit hours in IS 430, IS 492, and IS 494 has to take these courses from at least two different faculty members.

Only one course from each of the following pairs will count toward the accumulation of credits for the major:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 122</td>
<td>American Indians and Tradition</td>
</tr>
<tr>
<td>or IS 123</td>
<td>American Indians and Culture</td>
</tr>
<tr>
<td>IS 201</td>
<td>History of the Sioux</td>
</tr>
<tr>
<td>or IS 202</td>
<td>Cultures of the Sioux</td>
</tr>
<tr>
<td>or IS 203</td>
<td>History of the Ojibwe</td>
</tr>
<tr>
<td>or IS 204</td>
<td>Cultures of the Anishinabe</td>
</tr>
<tr>
<td>or IS 207</td>
<td>History of the Three Affiliated Tribes</td>
</tr>
<tr>
<td>or IS 208</td>
<td>Cultures of the Three Affiliated Tribes</td>
</tr>
</tbody>
</table>

Total Credits 36

B. In addition to the above curriculum, a concentration in an area or field other than American Indian Studies is also required of all majors.

This concentration may be met in the following ways:

1. Proficiency in a language (equivalent to Level IV in a Native American or other language)
2. A minor in another subject matter field

Minor in American Indian Studies

21 credit hours in American Indian Studies, at least 12 of which are 300-level or above.

The maximum combined credit hours taken from any one instructor to be counted towards the minor is twelve; to fulfill the requirements of the minor, a student has to take courses from at least three different instructors.

Courses

IS 121. Introduction to American Indian Studies. 3 Credits.
Introduction to main concepts, methods, and theories in American Indian Studies, designed to provide a background for further studies. This course approaches American Indian Studies from a perspective grounded in the humanities. F,S,SS.

IS 122. American Indians and Tradition. 3 Credits.
This course provides an introduction to the American Indian experience, as well as to methodological concepts of American Indian Studies. It places emphasis both on understanding how American Indians fit into various representations of the past and on how American Indians have used and continue to use the past to shape their own identities. F,SS,SS.

IS 123. American Indians and Culture. 3 Credits.
This course provides an introduction to the American Indian experience, as well as to methodological concepts of American Indian Studies. It places an emphasis on understanding Native cultures and the challenges they are facing, exploring contemporary issues and Native communities in their cultural contexts. F,S,SS.

IS 151. Popular Culture and American Indians. 3 Credits.
European settlers had firm notions of what tribal peoples on the American continent were like before even leaving Europe. This course will show how these stereotypes and ethnocentrism were perpetuated in various genres and fields, e.g. captivity tales, fiction, film, advertisements, and social media. Finally, students will analyze some recent examples of these stereotypes and ethnocentrism in print and film. SS.

IS 171. Hollywood Indians. 3 Credits.
A summer class exploring the portrayal and roles of American Indians in feature films from the early 20th century to the early 21st century, and what we can learn from these films. SS.

IS 181. Native North America to 1600. 3 Credits.
This course introduces students to thinking historically about North America’s pre-Columbian and early Columbian pasts and the relationship between the two both topically and methodologically. This will require students to consider the various sources and methods of anthropology and history while trying to understand the continuities and discontinuities that link the experiences of Native Americans before and after the arrival of Europeans and Africans. It will introduce students to close reading, research skills, college writing, and participatory classroom experiences. S.

IS 200. American Indians in a Multicultural Context. 3 Credits.
This course provides an introduction to multicultural and diversity issues, focusing primarily on the United States and with an emphasis on American Indian societies. It explores common experiences of Native and other minority groups, and discusses the integration of these ethnicities in a globalized world. F,S.
IS 201. History of the Sioux. 3 Credits.
This course explores the history of the Siouan speakers, predominantly the Dakota and Lakota nations, from their origins to today. It focuses primarily on the last two hundred years. The course gives a timeline for this history, explores the context of events, and discusses appropriate methodologies. S.

IS 202. Cultures of the Sioux. 3 Credits.
This class introduces the cultures of the Siouan speakers, predominantly the Lakota and Dakota nations, since the 19th century. The course addresses social organization, economies, religion, kinship, diplomacy, and the reasons, motivations, and consequences for cultural change. S.

IS 203. History of the Ojibwe. 3 Credits.
This course explores the history of the Anishinabe, predominantly the Chippewa or Ojibwe nations, from their origins to today. It focuses primarily on the last two hundred years. The course gives a timeline for this history, explores the context of events, and addresses some cultural issues. F.

IS 204. Cultures of the Anishinabe. 3 Credits.
This class introduces the cultures of the Anishinabe, predominantly the Chippewa or Ojibwe nations, since the 19th century. The course addresses social organization, economies, religion, kinship, diplomacy, and the reasons, motivations, and consequences for cultural change. F.

IS 207. History of the Three Affiliated Tribes. 3 Credits.
This course explores the history of the Mandan, Hidatsa, and Arikara nations, from their origins to today. It focuses primarily on the last two hundred years. The course gives a timeline for this history, explores the context of events, and discusses appropriate methodologies. S.

IS 208. Cultures of the Three Affiliated Tribes. 3 Credits.
This class introduces the cultures of the Mandan, Hidatsa, and Arikara nations since the 19th century. The course addresses social organization, economies, religion, kinship, diplomacy, and the reasons, motivations, and consequences for cultural change. S.

IS 221. North American Indians before 1815. 3 Credits.
This is a survey of the history of Native North America to 1815 that will study the diverse experiences of American Indians from arrival of Europeans until 1815. Topics that will be addressed include the development of cultural traditions, Indian responses to colonialism, and Indian influences on the emergence of Euroamerican communities in North America. F.

IS 222. North American Indians since 1815. 3 Credits.
This is an introductory survey of the history of Native North America since 1815. It will study the diverse experiences of American Indians since the era of Removal. Topics that will be addressed include the development of the reservation system, Western expansion and the Indians of the Trans-Mississippi West, and persistence and adaptation in the Twentieth Century. S.

IS 230. Approaches to Native Cultures. 3 Credits.
This course provides students with the background to an understanding of how Native cultures can be approached — how cultures have been and should be studied, described, conceptualized, invented, and imagined. The course focuses on North America, but might involve examples from other regions. F.

IS 240. Research and Writing in Indian Studies. 3 Credits.
The course will introduce students to professional writing in Indian Studies. The final goal is for students to turn out a 20-25 page research paper in an area of interest to them. S.

IS 250. Lakota Language I. 3 Credits.
This is the first of two Lakota language classes for beginning speakers. On demand.

IS 251. Lakota Languages II. 3 Credits.
This is the second of two Lakota language classes for beginning speakers. Prerequisites: IS 250 or permission. On demand.

IS 311. Health and American Indian Cultures. 3 Credits.
The course investigates cultural perceptions of health as well as specific historic and contemporary health problems in indigenous communities in Canada and the United States. F.

IS 320. Native Cultural Landscapes. 3 Credits.
This course engages the notion of landscape - the environment as made meaningful by cultural perspectives on interactions and responsibilities. It investigates how American Indian cultures create, imagine, construct, map, and interact with landscapes and how they render them meaningful. F.

IS 344. Education and American Indians. 3 Credits.
Throughout the centuries of American Indian and white contact, American Indian education advocated by the colonial and federal governments as well as by various denominations has reflected the changing attitudes, stereotypes, and ethnocentrism of Europeans and Euroamericans toward American Indian peoples. This course will examine the changing policies of the federal government, the attitudes of the various denominations, and some of the contemporary changes in the educational system. S.

IS 346. Gender in American Indian Cultures. 3 Credits.
This class will look at the ways American Indian cultures define various genders and their roles and contributions in historical and contemporary times. S.

IS 348. Beyond the Reservation. 3 Credits.
This is an advanced course that introduces students to the scholarship on American Indians living and working in places beyond their traditional communities. The course will look at issues such as work and labor, urban Indian communities, pan-Indian identities, and contributions to American institutions and public life. S.

IS 350. Native American Languages. 3 Credits.
This course provides an overview of Native American languages, the connection of culture to language, an introduction to socio-linguistics, and other discussions of language structure and linguistics as they pertain to Native North America. F.

IS 352. Native Philosophies and Religions. 3 Credits.
Introduces students to the complex and rich religions of Native Americans, from traditional religions to the Native American Church and the American Indian Religious Freedom Act. Both traditional and contemporary belief systems are discussed. F.

IS 354. Dynamics of Conquest and Resistance. 3 Credits.
This course is an advanced course on the experiences of Indian peoples in colonial Latin America and to the historical methods used to study them. The course will cover the period from late pre-Columbian times through Latin American Independence and will address topics including the conquest of core Indian civilizations, the creation of colonial Indian identities in the republica de los Indios, the persistence of Indios barbaros on the frontiers, and the meaning of Latin American independence for Indians. F.

IS 356. Law, Culture, and Communities. 3 Credits.
This course explores in what ways laws impact indigenous communities, and how different communities use, construct, and perceive laws. It explores the cultural construction and meaning of law through its implementation in and on Native communities. F.

IS 358. American Indians and Sovereignty. 3 Credits.
This course is an historical inquiry into the colonial imposition of sovereignty onto Native America and the resulting American Indian tribal claims to sovereignty and the concomitant development of “Indian law” within the legal frameworks of modern North American nation states (Canada, United States, and Mexico). It will examine the initial colonial encounters between indigenous and imperial legal cultures, the 19th century United States policies and judicial findings that established precedents for continued Indian sovereignty, and the expansion of those precedents and how over the course of the 20th century Indian nations have used these to establish federally recognized tribal governments and established the place of “Indian common law” as the law in Indian country. We will also look at how issues of sovereignty impact issues such as gaming, natural resource management, and economic development. S, even years.

IS 360. Oral Traditions in American Indian Cultures. 3 Credits.
Despite all predictions that they would disappear, American Indian oral traditions are as strong today as ever before. This course will introduce students to the complexities, richness, and conventions of different oral traditions as well as to the collecting process. F.

IS 362. Resource Extraction and Indigenous Peoples. 3 Credits.
This course takes a critical look at the impacts of resource extraction and its consequences on indigenous peoples and their communities, how indigenous peoples have participated in and resisted resource extraction, and at the economic, ecological, political, and cultural consequences of resource extraction. S, odd years.

IS 379. Special Topics. 1-3 Credits.
Topics and credits will vary with availability of staff, and with student interests. Repeatable when topics vary. Repeatable.
IS 385. Sustainable Communities. 3 Credits.
This course discusses how societies can build sustainable communities, focusing on indigenous communities in North America and through comparison around the globe. F.

IS 395. Ethnohistory of North America. 3 Credits.
This course introduces students to the historical study of Indian peoples of North America during the colonial and early national periods, particularly in situations where their voices or perspectives are not easily or explicitly captured in historical documentation of their own making. It will focus on key historiographic issues concerning the nature of frontiers and Indian agency as well as on historical method.

IS 410. Indigenous Identities. 3 Credits.
This course looks at issues of indigenous identity: how do people define themselves and others, and what criteria do they use to construct, invent, and imagine their identities? The course focuses on North America, but also looks at global indigenous identities. S.

IS 430. Internship in American Indian Studies. 3 Credits.
Internships provide the opportunity for students to have a meaningful experience related to their field of interest within Indian Studies. Internship placements are with Native American related public or private sector sponsors such as tribal programs, businesses including tribal businesses on a reservation, and various state or private agencies serving Indian populations and causes. Individual learning agreements approved by the Indian Studies faculty and sponsoring supervisors specify student goals, objectives, and methods of assessment. It is expected that students will be of service to the sponsor. Internships may be paid. Prerequisites: Upperclass standing and instructor permission. F,S,SS.

IS 492. Directed Readings in American Indian Studies. 1-3 Credits.
Under the direction of American Indian Studies faculty, students will select readings in subjects not covered in sufficient detail in other American Indian Studies classes. IS 492 and IS 494 combined may be taken for a maximum of 9 credits; must be taken from at least two different faculty if above 6 credits. Prerequisites: Upperclass standing and consent of instructor. Repeatable to 9 credits. F,S,SS.

IS 494. Independent Study in American Indian Studies. 1-3 Credits.
Under the direction of American Indian Studies faculty, students will engage in independent research projects in American Indian Studies subjects. IS 492 and IS 494 combined may be taken for a maximum of 9 credits; must be taken from at least two different faculty if above 6 credits. Prerequisites: Upperclass standing and instructor permission. Repeatable to 9 credits. F,S,SS.

Anatomy and Cell Biology (Anat)
http://www.med.und.edu/basic-sciences/
The Department of Basic Sciences offers undergraduate courses in human anatomy that serve majors and programs across colleges at UND.

Courses
ANAT 204. Anatomy for Paramedical Personnel. 3 Credits.
Two lectures per week presenting a system-based study of human gross anatomy. Prerequisite: Must have 12 or more credits. F,S.

ANAT 204L. Anatomy for Paramedical Personnel Laboratory. 2 Credits.
Laboratory exploration of human gross anatomy to complement Anatomy 204. Prerequisite or Corequisite: ANAT 204. F,S.

Anthropology (Anth)
http://www.arts-sciences.und.edu/anthropology
Cuozzo, Leach, Mihelich (Chair), Mikulak, Scharf and Stubblefield

College of Arts and Sciences
An undergraduate major in anthropology can serve as the nucleus for a general liberal arts education, or as the prerequisite for a graduate education that will qualify a person for positions in:
1. college and university teaching,
2. research, and
3. administrative and applied positions in government, non-governmental organizations, and museums.

American anthropology is divided into four main sub-areas—archaeology, cultural anthropology, linguistic anthropology, and biological anthropology. The undergraduate program at UND emphasizes work in the three areas of archaeology, cultural, and biological anthropology. Both a major and a minor are offered in anthropology.

B.A. with a Major in Anthropology
Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum (33 Major Credits):

Select one of the following (Cultural):

ANTH 170 Introduction to Biological Anthropology 3
ANTH 171 Introduction to Cultural Anthropology 3
ANTH 172 Introduction to Archaeology 3
ANTH 480 Senior Seminar 3

Method and Theory

Select one of the following (Method and Theory):

ANTH 350 Ethnographic Methods
ANTH 371 Cultural Dynamics
ANTH 372 Culture Theory

Select one of the following (Archaeology):

ANTH 300 Archaeological Laboratory Methods
ANTH 375 Women in Prehistory
ANTH 380 Field Techniques in Archaeology
ANTH 388 Method and Theory in Archaeology
ANTH 420 Archaeological Origins of Plant and Animal Use
ANTH 426 Lithic Technology

Select one of the following (Physical):

ANTH 325 Human Origins
ANTH 330 Human Variation
ANTH 335 Primates
ANTH 378 Physical Anthropology Method and Theory
ANTH 439 Human Osteology

Electives in Anthropology 12

Total Credits 33

Required in other departments:
A concentration in a single supplementary field other than anthropology is also required of all anthropology majors. This concentration may be met in two ways:

1. a language proficiency of level IV in a modern foreign language; or
2. 20 credit hours, at least 9 of which must be numbered 300 or above, in any single subject matter taught at this university.

Minor in Anthropology
Required 21 credits including:

Select one of the following (Method and Theory):

ANTH 300 Archaeological Laboratory Methods
ANTH 325 Human Origins
ANTH 330 Human Variation
ANTH 335 Primates
ANTH 350 Ethnographic Methods
ANTH 371 Cultural Dynamics
ANTH 372 Culture Theory
ANTH 375  Women in Prehistory
ANTH 378  Physical Anthropology Method and Theory
ANTH 380  Field Techniques in Archaeology
ANTH 388  Method and Theory in Archaeology
ANTH 420  Archaeological Origins of Plant and Animal Use
ANTH 426  Lithic Technology
ANTH 439  Human Osteology

Electives in Anthropology  9

Total Credits  21

Courses

ANTH 100. Introduction to Anthropology. 3 Credits.
An introduction to the breadth of inquiry pursued by anthropologists, including the origins and biological evolution of humans, the prehistoric development of world cultures, and the interplay of biological, social, and cultural factors in present day societies. On demand.

ANTH 120. Introduction to the Forensic Sciences. 3 Credits.
Introduction to Forensic Sciences is for those who are curious about the many fields of the forensic sciences but have no previous background in: a) science; and/or b) forensic science. This course will explore some of the actual techniques illustrated in popular descriptions of the forensic sciences. In addition to lectures and discussions of the fields of the forensic sciences, students will engage in practical group and individual activities that will promote their understanding of what science is and how is is applied to crime solving and every day life. Students must be able to attend a one-hour laboratory section in addition to lecture times. On demand.

ANTH 170. Introduction to Biological Anthropology. 3 Credits.
An introduction to the field of biological or physical anthropology. This course will provide a general background in human evolution. F.S.

ANTH 171. Introduction to Cultural Anthropology. 3 Credits.
Examination of diversity and similarities across contemporary world societies. Topics: fieldwork and ethnographic description; theoretical approaches; communication/human language; interrelationships between environment, technology, social and political organization and worldview; sociocultural change; applied anthropology. Films and case studies illustrate intricacies of culture and how an anthropological perspective provides insights about our own society/culture. F.S.

ANTH 172. Introduction to Archaeology. 3 Credits.
This course looks at how we investigate past cultures using the artifacts that people have left behind. What questions do archaeologists ask about the past? How do archaeologists find and record archaeological sites? What field and laboratory techniques are used to collect evidence and gather data, and how do these methods work? How do we interpret and understand the past using archaeological hypotheses, explanations, models and theories? Case studies will be drawn from different regions, cultures, and time periods to illustrate course concepts. F.S.

ANTH 200. World Prehistory. 3 Credits.
In this course we explore the extraordinary five million year long record of human cultural achievements, as reconstructed by scientific archaeology. We will focus on prehistoric societies (those that existed before the advent of writing and written history), on what happened in the past, and how the major milestones in the development of world cultures came about. These milestones include the cultural evolution of our earliest hominid ancestors from almost 5 million years ago, the two million year long persistence of the hunting and gathering lifestyle, the origins of agriculture and farming societies, and the rise and collapse of prehistoric civilizations. F.S.

ANTH 209. Special Topics. 1-4 Credits.
Repeatable when topics vary. Repeatable. F.S.

ANTH 270. Introduction to Forensic Anthropology. 3 Credits.
Forensic anthropology is the study of skeletal remains in a medicolegal context for the purpose of identification and trauma analysis. This course covers the history of this field, its relevance to death investigation in the United States, and the theories and techniques applied to skeletal identification. On demand.

ANTH 300. Archaeological Laboratory Methods. 3 Credits.
A hands-on introduction to the basic processing, organizing, and analytical techniques used in the archaeological laboratory. Excavated materials from prehistoric sites will be used for lab exercises and demonstrations. Includes lecture and lab. Prerequisites: ANTH 172 and permission of instructor. S.

ANTH 309. Special Topics. 1-4 Credits.
Repeatable when topics vary. Repeatable. F.S.

ANTH 325. Human Origins. 3 Credits.
A description of the fossil evidence for climate and human evolution with an emphasis on the origins and evolution of the hominid and human lines. Prerequisite: ANTH 170 or consent of instructor. On demand.

ANTH 330. Human Variation. 3 Credits.
An examination of the range of human physical variation, with a special emphasis on its adaptive nature. Prerequisite: ANTH 170 or consent of instructor. On demand.

ANTH 335. Primates. 3 Credits.
A survey of the biology and behavior of the living primates, with a special emphasis on similarities and differences to humans. On demand.

ANTH 340. Medical Anthropology. 3 Credits.
An examination of the human biological and cultural responses to health and disease as seen from an anthropological perspective. F.

ANTH 345. Forensic Science. 3 Credits.
An exposure to the basic methods and theoretical bases and inter-relationships of the forensic sciences. A major emphasis is placed on death investigation. F.

ANTH 346. Analysis of Forensic Evidence. 3 Credits.
Emphasis on the practical applications of the forensic sciences. Whenever possible and practical, hands-on exercises will reinforce course topics. Prerequisite: ANTH 345 with a grade of C or better; Forensic Science majors and Criminal Justice majors and minors only or by instructor's consent. S.

ANTH 350. Ethnographic Methods. 3 Credits.
Introduction to fieldwork methods and analytic approaches used by cultural anthropologists in their ethnographic research; class discussion topics will include ethical issues, framing of research problems, the writing of ethnographic accounts, and modes of presentation of research results. Prerequisite: ANTH 171 or by special permission. On demand.

ANTH 370. Language and Culture. 3 Credits.
Fundamentals of modern linguistics; utility of linguistic concepts of culture analysis; interaction of language with other cultural subsystems. Prerequisite: ANTH 171 or consent of instructor. S.

ANTH 371. Cultural Dynamics. 3 Credits.
Focus on sociocultural change along a selected theme, such as "the local and the global," "ethnic minorities and nation-states," or "ethnographer as researcher and writer." Also considered are theoretical orientations in the study of society/culture, fieldwork, ethics, and anthropologists' roles with respect to public policy. Repeatable to 9 credits if topics vary. Prerequisite: ANTH 171. Repeatable to 9 credits. F.

ANTH 372. Culture Theory. 3 Credits.
An overview of the ideas and approaches that have played a role in the development of anthropological studies of societies and cultures. Focus on the contributions of major figures in anthropology, in the past and at present, as well as current issues within the discipline. Prerequisite: ANTH 171.

ANTH 373. Indians of Latin America. 3 Credits.
Examination of traditional and modern Indian cultures of Latin America. Focus on the adaptation to cultural change, the impact of world economy, and the impact of resource exploitation on indigenous peoples. Prerequisite: ANTH 171.

ANTH 375. Women in Prehistory. 3 Credits.
This course will explore recent research that explicitly illuminates women's roles, behaviors and ideologies in the ancient past, and will examine methodological and theoretical attempts to understand how gender can be retrieved from the archaeological record. On demand.

ANTH 376. The Aztec, Maya and Inca. 3 Credits.
An examination of the high civilizations of Latin America with focus on the Aztec, Maya and Inca. On demand.

ANTH 377. North American Archaeology. 3 Credits.
Explores the fascinating cultural developments that have taken place throughout prehistory in North America (north of Mexico), ranging from the first peopling of the Americas to the emergence of complex chiefdoms, and from hunting and gathering to the development of intensive agriculture. On demand.

ANTH 378. Physical Anthropology Method and Theory. 1-4 Credits.
A discussion of current theoretical arguments within the field of physical anthropology and the techniques used to examine them. Prerequisite: ANTH 170. S.
ANTH 379. Culture Area Studies. 3 Credits. 
A survey of peoples and cultures of selected areas. Selections based upon staff and student interest. May be repeated to a maximum of 6 credits. Repeatable to 6 credits. F.S.

ANTH 380. Field Techniques in Archaeology. 1-6 Credits. 
Prerequisites: ANTH 172 and permission of instructor. SS.

ANTH 388. Method and Theory in Archaeology. 3 Credits. 
This course explores how archaeologists reconstruct the past: how they formulate research problems and conduct field work; what field and laboratory analytical tools they employ; and how they use data, models, and theory to explain culture change. Techniques, methods, and theoretical frameworks used in modern prehistoric archaeology are examined. Readings in the professional literature, case studies, and guest lectures provide vivid examples of archaeologists in thought and action. Prerequisite: ANTH 172 or consent of instructor. S.

ANTH 420. Archaeological Origins of Plant and Animal Use. 3 Credits. 
This course uses archaeological information to examine the relationships between humans and the plant and animal resources we exploit and will focus on specific examples of economic uses of both wild and domestic species, covering both prehistoric and modern consequences of how we interact with biological resources. Basic issues in floral and faunal analysis such as the recovery, quantification, analysis, and interpretation of plant and animal remains from archaeological sites will be presented in depth. Prerequisite: ANTH 172. On demand.

ANTH 426. Lithic Technology. 3 Credits. 
Study of prehistoric stone tool technology and examination of the analytical methods used by archaeologists in lithics research. Prerequisite: ANTH 172 or consent of instructor. F, odd years.

ANTH 439. Human Osteology. 4 Credits. 
This course is an intensive examination of human skeletal anatomy, covering the features of the entire human skeleton and the relationship of human osteology to other fields, including paleoanthropology, paleopathology, forensic anthropology, and vertebrate anatomy. Prerequisite: ANTH 170 or ANTH 270 or ANAT 204 or consent of instructor. F.

ANTH 441. Forensic Anthropology Field School. 1-6 Credits. 
This course is a hands-on exposure to the field and laboratory methods of forensic anthropology. Prerequisite: Consent of instructor. SS.

ANTH 465. Culture, Illness and Health. 3 Credits. 
Examination of culturally-based beliefs and practices involved in maintenance of health and the handling of illness in non-Western and modern societies. Prerequisite: ANTH 171 or consent of instructor. S.

ANTH 480. Senior Seminar. 3 Credits. 
The seminar will examine current debates or an area of study involving two or more subfields of anthropology. The seminar will provide an opportunity for students to integrate knowledge and skills obtained in anthropology. Prerequisites: Senior major status and completion of two of the three method and theory requirements (cultural, archaeology, biological); or departmental permission. S.

ANTH 489. Senior Honors Thesis. 1-8 Credits. 
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F.S.S.S.

ANTH 492. Independent Studies. 1-4 Credits. 
Independent research conducted under advisement with department faculty. Research is student originated and developed. Prerequisite: Consent of the instructor. Repeatable to 16 credits. F.S.

ANTH 494. Readings in Anthropology. 1-5 Credits. 
Designed for students who wish instruction in subjects not covered adequately in usual course offerings. Special arrangements must be made with an instructor prior to registration. Prerequisite: Consent of the instructor. Repeatable to 5 credits. F.S.

ANTH 497. Forensic Science Internship. 1-12 Credits. 
Students may enroll in this course after they have secured an intern position in a law enforcement agency, crime laboratory or other institution providing procedural and/or analytical processing of evidence from criminal or civil proceedings. Credits obtained will be determined based on length and content of the internship and course responsibilities. Prerequisites: Junior or Senior status, satisfactory completion of CHEM 122 and BIOL 151, and instructor consent. S/U grading. F.S.S.S.

ANTH 499. Art and Design. 
http://www.arts-sciences.und.edu/art-design
Gonzalez-Smith, Herbert, Jones (Chair), Luber, Smith and Widmer
The Art and Design Department provides opportunities for both the potential professional practitioner and the appreciator to study in the various disciplines and media of the visual arts. The broad categories are: two-dimensional (drawing, painting, photography, printmaking, and graphic design), three-dimensional (ceramics, sculpture and jewelry and metalsmithing), art history, and art education. A core of study in the foundations of the visual arts is followed by the development of skills and technical knowledge in the various media. These are prerequisite to the ultimate objective of nurturing growth in conceptual ability and creative production. The Art and Design department's faculty are highly qualified and dedicated teachers, who are also seriously committed to professional productivity in their respective art disciplines. The Edmund Hughes Fine Arts Center provides more than 35,000 square feet for specialized studios and opportunities for work in visual arts media.

The Art and Design Department is an accredited institutional member of the National Association of Schools of Art and Design.

Teacher Licensure (p. 56) B.F.A. with Major in Visual Arts (p. 55) B.F.A. with Major in Graphic Design and New Art Media (p. 55) B.A. with Major in Visual Arts (p. 55)

College of Arts and Sciences

B.F.A. with Major in Visual Arts
The Bachelor of Fine Arts program in Art is offered to students with marked abilities who desire an intensive undergraduate concentration in visual art, in preparation for either a career as a professional artist, for graduate study leading to the MFA, or both. Candidates accepted for the program will be expected to maintain a high standard of excellence, demonstrate significant artistic growth, and a 3.00 grade point average in all art courses.

Candidates seeking admission to the BFA program must submit an application to the chairperson who will then schedule a portfolio presentation and personal interview for the candidate with a committee consisting of three departmental faculty members. Each student's portfolio will be reviewed annually by departmental faculty, who will make a recommendation concerning the student's status in the BFA program. If probation is recommended, students may apply for readmission at the completion of a full semester. Readmission will be contingent upon faculty evaluation.

Before advancement to upper-division status, all BFA candidates must participate in review and evaluation by the departmental faculty.

Major Emphasis Area Courses
At least 24 credits must be completed in one of the following emphasis areas:

- Ceramics
- Drawing
- Jewelry and Metalsmithing
- Photography
- Printmaking
- Time-based Media
- Sculpture
- Fibers
- Painting

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum of 78 major credits:

All BFA degree majors in Art have a minimum requirement of 78 credits in Art and Art History courses. Distribution of those credits is as follows:

Core Requirements
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ART 112</td>
<td>Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 114</td>
<td>Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 130</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 210</td>
<td>History of Art I</td>
<td>3</td>
</tr>
<tr>
<td>ART 211</td>
<td>History of Art II</td>
<td>3</td>
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<tr>
<td><strong>Additional supportive courses</strong></td>
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<tr>
<td>ART 212</td>
<td>Concepts of Art</td>
<td>3</td>
</tr>
<tr>
<td>ART 230</td>
<td>Drawing II</td>
<td>3</td>
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<tr>
<td>Any 200-level graphic design or new media course</td>
<td>3</td>
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<tr>
<td><strong>Studies in Studio Art outside emphasis area</strong></td>
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<tr>
<td>Select a combination of the following to total 12 credits:</td>
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<tr>
<td>200-level two-dimensional studio art courses</td>
<td>3-6</td>
<td></td>
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<tr>
<td>200-level three-dimensional studio art courses</td>
<td>3-6</td>
<td></td>
</tr>
<tr>
<td>300-level two-dimensional studio art courses</td>
<td>0-3</td>
<td></td>
</tr>
<tr>
<td>300-level three-dimensional studio art courses</td>
<td>0-3</td>
<td></td>
</tr>
<tr>
<td><strong>Studies in Art History</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select a combination of the following to total 6 credits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any 400-level art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Any 400-level art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Studies in Studio Art Emphasis Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select a combination of the following to total 24 credits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200-level studio art courses</td>
<td>3-6</td>
<td></td>
</tr>
<tr>
<td>300-level studio art courses</td>
<td>0-12</td>
<td></td>
</tr>
<tr>
<td>400-level studio art courses</td>
<td>6-18</td>
<td></td>
</tr>
<tr>
<td>ART 494</td>
<td>Professional Exhibition</td>
<td>3</td>
</tr>
<tr>
<td><strong>Art Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Exhibition Requirement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Credits</td>
<td>60-99</td>
<td></td>
</tr>
</tbody>
</table>

* All BFA candidates are also required to produce a BFA Exhibition with the approval of their faculty adviser and in conjunction with the ART 494 Professional Exhibition course.

**Teacher Licensure**

Through a partnership with the College of Education and Human Development and the Department of Teaching and Learning, students may seek secondary licensure in Art. The following program of study must be completed:

I. Requirements for the B.F.A. with major in Visual Arts.

II. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 615) for admission and licensing requirements.)

III. The program in Secondary Education, to include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 386</td>
<td>Field Experience</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 390</td>
<td>Special Topics</td>
<td>1-3</td>
</tr>
<tr>
<td>ART 461</td>
<td>Methods and Materials of Teaching Middle and</td>
<td>3</td>
</tr>
<tr>
<td>Secondary School Art</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T&amp;L 432</td>
<td>Learning Environments</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>16</td>
</tr>
<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Total Credits</td>
<td>43-45</td>
<td></td>
</tr>
</tbody>
</table>

* T&L 390 Special Topics, may be taken as an elective.

Art majors seeking secondary licensure must have an adviser in both the Art Department and the Department of Teaching and Learning.

**B.F.A. with Major in Graphic Design and New Art Media**

Candidates seeking admission to the BFA program in Graphic Design and New Art Media must submit an application to the chairperson who will then schedule a portfolio presentation and personal interview for the candidate with a committee consisting of three departmental faculty members. Candidates accepted for the program will be expected to maintain a high standard of excellence, demonstrate significant artistic growth, and a 3.00 grade point average in all art courses. Before advancement to upper-division status, all B.F.A. candidates must participate in review and evaluation by the departmental faculty.

Each student’s portfolio will be reviewed annually by departmental faculty, which will make a recommendation concerning the student’s status in the program. If probation is recommended, students may apply for readmission at the completion of a full semester. Readmission in the B.F.A. program in Graphic Design and New Art Media will be contingent upon faculty evaluation.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The following curriculum of 78 major credits:

All BFA degree majors in Art have a minimum requirement of 78 credits in Art and Art History courses. Distribution of those credits is as follows:

**Core Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 112</td>
<td>Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 114</td>
<td>Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 130</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 210</td>
<td>History of Art I</td>
<td>3</td>
</tr>
<tr>
<td>ART 211</td>
<td>History of Art II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Additional supportive courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 240</td>
<td>Printmaking I</td>
<td>3</td>
</tr>
<tr>
<td>ART 245</td>
<td>Black and White Photography</td>
<td>3</td>
</tr>
<tr>
<td>ART 260</td>
<td>Color Photography</td>
<td>3</td>
</tr>
<tr>
<td>ART 272</td>
<td>Timebased Media I - Time Design and Digital Media</td>
<td>3</td>
</tr>
<tr>
<td><strong>Studies in Studio Art outside emphasis area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 230</td>
<td>Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>200/300-level studio art courses</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>200/300-level studio art courses</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Studies in Art History</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 413</td>
<td>History of Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>Any 400-level art history courses</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Any 400-level art history courses</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Studies in Graphic Design and New Art Media</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 273</td>
<td>Graphic Design Foundations</td>
<td>3</td>
</tr>
<tr>
<td>ART 382</td>
<td>Typography</td>
<td>3</td>
</tr>
<tr>
<td>ART 480</td>
<td>Advanced Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 481</td>
<td>Graphic Design Internship</td>
<td>3</td>
</tr>
<tr>
<td>Any additional graphic design courses</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>ART 494</td>
<td>Professional Exhibition</td>
<td>3</td>
</tr>
<tr>
<td><strong>Art Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
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<tr>
<td>300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Exhibition Requirement

Total Credits

- 9 credits from courses in drawing, painting, printmaking, photography, timebased media, sculpture, ceramics, fibers, or jewelry and metalsmithing
- All B.F.A. candidates are also required to produce a BFA Exhibition with the approval of their faculty adviser and in conjunction with the ART 494 Professional Exhibition course.
- 9 credits selected from courses in graphic design, timebased media, printmaking, drawing, painting, sculpture, ceramics, fibers, jewelry and metalsmithing, or art history

B.A. with Major in Visual Arts

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which much be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum of 42 major credits:

All BA degree majors in Art have a minimum requirement of 42 credits in Art and Art History courses. Distribution of those credits is as follows:

<table>
<thead>
<tr>
<th>Core Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 112 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 114 Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 130 Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 210 History of Art I</td>
<td>3</td>
</tr>
<tr>
<td>ART 211 History of Art II</td>
<td>3</td>
</tr>
<tr>
<td>Studies in Studio Art</td>
<td></td>
</tr>
<tr>
<td>Any 200-level two-dimensional studio art course</td>
<td>3</td>
</tr>
<tr>
<td>Any 200-level three-dimensional studio art course</td>
<td>3</td>
</tr>
<tr>
<td>Any 200-level studio art course</td>
<td>3</td>
</tr>
<tr>
<td>Any 300/400-level studio art course</td>
<td>3</td>
</tr>
<tr>
<td>Any 300/400-level studio art course</td>
<td>3</td>
</tr>
<tr>
<td>Studies in Art History</td>
<td></td>
</tr>
<tr>
<td>Any 400-level art history course</td>
<td>3</td>
</tr>
<tr>
<td>Art Electives</td>
<td></td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
</tr>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>42</td>
</tr>
</tbody>
</table>

College of Arts and Sciences

Minor in Visual Arts (Studio)

Required 21 credits including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 110 Introduction to the Visual Arts</td>
<td>3</td>
</tr>
<tr>
<td>ART 112 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 130 Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 230 Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>Additional studio art or art history courses</td>
<td>9</td>
</tr>
<tr>
<td>Total Credits</td>
<td>21</td>
</tr>
</tbody>
</table>

Minor in Art History

Required 24 credits including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 112 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 120 Introduction to Drawing and Color Materials</td>
<td>3</td>
</tr>
<tr>
<td>ART 210 History of Art I</td>
<td>3</td>
</tr>
<tr>
<td>ART 211 History of Art II</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional 400-level art history courses | 12

Total Credits | 24

Minor in Graphic Design and New Art Media

Required 21 credits including:

I. Core Curriculum (12 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 112 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 114 Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 272 Timebased Media I - Time Design and Digital Media</td>
<td>3</td>
</tr>
<tr>
<td>ART 273 Graphic Design Foundations</td>
<td>3</td>
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<tr>
<td>Total Credits</td>
<td>12</td>
</tr>
</tbody>
</table>

II. Additional Supportive Credits in Graphic Design and New Art Media (9 credits)

Select three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 380 Timebased Media II - Digital Video</td>
<td>3</td>
</tr>
<tr>
<td>ART 381 Timebased Media III - Motion Graphics</td>
<td>3</td>
</tr>
<tr>
<td>ART 382 Typography</td>
<td>3</td>
</tr>
<tr>
<td>ART 383 Timebased Media IV - Animation</td>
<td>3</td>
</tr>
<tr>
<td>ART 413 History of Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 480 Advanced Graphic Design (repeatable)</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>9</td>
</tr>
</tbody>
</table>

College of Education and Human Development

Minor in Visual Arts Education (Middle or Secondary)

See Minor in Art above.

Courses

ART 100. Introduction to Sculpture. 3 Credits.
Introduction for non-majors to sculpture materials, process, and concepts. Appropriate art safety instruction will be included. F.

ART 110. Introduction to the Visual Arts. 3 Credits.
Introduction to basic principles of visual perception and interpretation, with emphasis on visual theories, cultural influences, historical and ethical perspectives. This course will provide an overview of ways in which visual elements are used to communicate and influence meaning, as well as provide students analytical tools to advance visual literacy. F,S.

ART 112. Basic Design. 3 Credits.
This is a foundation studio course which introduces design principles, aesthetic considerations, and basic techniques of working as they relate to the creation of two-dimensional and three-dimensional art. Appropriate art safety instruction will be included. F.S.

ART 114. Visual Persuasion. 3 Credits.
This is a foundation studio course which introduces basic principles of visual perception and interpretation, with emphasis on visual theories, cultural influences, historical and ethical perspectives. This course will provide an overview of ways in which visual elements are used to communicate and influence meaning, as well as provide students analytical tools to advance visual literacy. F,S.

ART 120. Introduction to Drawing and Color Materials. 3 Credits.
Introduction for non-majors to drawing and color media and techniques. Includes working from stilllifes, models, and landscapes. Appropriate art safety instruction will be included. F.S.

ART 130. Drawing I. 3 Credits.
Study and application of different drawing media, methods and techniques. Form, proportion, composition, and perspective covering a wide range of media and subject; experimentation in line and color quality; figure work. Appropriate art safety instruction will be included. F.S.
ART 151. Introduction to Ceramics. 3 Credits.
Introduction of non-majors to a variety of cultural backgrounds and techniques required to make hand-built ceramic forms. This is achieved through lectures, discussions, demonstrations and readings. Appropriate art safety instruction will be included. S/U grading. F.S.

ART 200. Sculpture I. 3 Credits.
Introduction to philosophy, aesthetics, history, and processes of sculpture. Demonstration in the use of metals, stone, clay, plaster, wood, etc. Appropriate art safety instruction will be included. F.S.

ART 204. Jewelry and Metalsmithing I. 3 Credits.
This studio course is an investigation into the tools, techniques, and processes fundamental to the designing and fabrication of contemporary wearable and non-wearable art executed predominantly in precious/semi-precious metal. The principles will be practiced and studied through individual projects, leading to proficiency for the making of body adornments, holloware, and simple fabricated objects. Appropriate art safety instruction will be included. F.S.

ART 210. History of Art I. 3 Credits.
Introductory survey of art history from Paleolithic to Renaissance. F.

ART 211. History of Art II. 3 Credits.
Introductory survey of art history from Renaissance to present. S.

ART 212. Concepts of Art. 3 Credits.
This course critically examines how materials, techniques, principles of design, and visual strategies are applied to the production of fine art. Drawing upon content of core requirements, this course emphasizes the development of concepts in preparation for advanced study in upper division courses. Appropriate art safety instruction will be included. F.

ART 220. Painting I. 3 Credits.
Experimentation with oil painting and associated media with emphasis upon creative compositions, using figure models, still-life subjects and imaginative contemporary expressions. Appropriate art safety instruction will be included. F.S.

ART 221. Painting II. 3 Credits.
Continuation of concepts and techniques explored in Painting I. Appropriate art safety instruction will be included. Prerequisite: ART 220. F.S.

ART 230. Drawing II. 3 Credits.
Advanced study and application of different drawing media, methods, and techniques. A continuation of the skills and concepts developed in Drawing I. Appropriate art safety instruction will be included. Prerequisite: ART 130. F.S.

ART 240. Printmaking I. 3 Credits.
Introduction to basic traditional printmaking processes including relief, etching, lithography, and silkscreen printing. Appropriate art safety instruction will be included. F.S.

ART 245. Black and White Photography I. 3 Credits.
Introduction to black and white photography in a visual arts environment. Emphasis is placed on developing an understanding of fine art photography through the practice of visualization and print making. Coursework includes an introduction to basic black and white film and paper processing. Appropriate art safety instruction will be included. F.S.

ART 246. Black and White Photography II. 3 Credits.
Applications of black and white photography in a visual arts environment. Emphasis will be placed on composition, lighting and subject content as it supports fine art photography. Course content includes lessons in historical processes. Appropriate art safety instruction will be included. Prerequisite: ART 245. S.

ART 250. Ceramics: Handbuilding. 3 Credits.
Introduction to ceramics techniques. A beginning course for majors. Proficiency in the basic hand forming processes and glazing techniques and an understanding of the clay and firing processes are achieved through lectures, discussions, demonstrations, and readings. Appropriate art safety instruction will be included. F.S.

ART 253. Ceramics: Throwing. 3 Credits.
Throwing is the process by which a form is made on the potter's wheel. During the semester emphasis is placed on centering the clay on the wheel and mastering basic forms, shaping techniques and glaze applications as well as firing processes. This is achieved through lectures, demonstrations, discussions, and readings. Appropriate art safety instruction will be included. F.S.

ART 260. Color Photography. 3 Credits.
A beginning non-darkroom oriented class in color photography emphasizing the aesthetic, design and compositional aspects of this artistic medium. Appropriate art safety instruction will be included. F.S, SS.

ART 272. Timebased Media I - Time Design and Digital Media. 3 Credits.
Introduction to visual study in time and motion with a focus on the principals, techniques and history of animation. This course will explore the fundamental concepts of the form and instruct in the application of computer software. Appropriate art safety instruction will be included. F.S.

ART 273. Graphic Design Foundations. 3 Credits.
An introduction to the art, language, key elements, theory and practice of graphic design. This course will focus on the integration of type, imagery and spatial relationships in design. Students will be introduced to the conceptual design process, communicating with clients, high quality crafting and production. Appropriate art safety instruction will be included. Prerequisite or Corequisite: ART 114. F.

ART 277. Fibers I. 3 Credits.
Samples and finished art projects of student's design carried out exploring technical and design possibilities of various textile techniques. Demonstrations/ slide lectures/studio work. Appropriate art safety instruction will be included. F.S.

ART 301. Sculpture II. 3 Credits.
Continuation of Sculpture I. Appropriate art safety instruction will be included. Prerequisite: ART 200. F.S.

ART 304. Intermediate Ceramics. 3 Credits.
This course will have specific technical ceramic applications, applicable to the exploration of intermediate level hand building and/or throwing techniques. The conceptual development of the student's work is encouraged and may include both ceramic work and/or readings. Appropriate art safety instruction will be included. Repeatable to 12 credits. Prerequisites: ART 112, ART 114, ART 130, ART 151 or ART 250, ART 253 or consent of the instructor. Repeatable to 12 credits. F.S.

ART 305. Jewelry and Metalsmithing II. 3 Credits.
A continuation and expansion of Jewelry and Metalsmithing I. Specialized techniques and processes utilized in metal fabrication will produce works ranging from body adornment to small sculpture. Emphasis will be placed on the theoretical and conceptual growth of the student and the development of a self-directed personal aesthetic expression. Appropriate art safety instruction will be included. Prerequisite: ART 204 or consent of instructor. F.S.

ART 340. Printmaking II. 3 Credits.
Intermediate-level investigation of traditional printmaking processes acquired in ART 240, as well as multiple-color printing, experimental print processes, photo-printing, computer-generated printmaking and non-toxic printing processes. Appropriate art safety instruction will be included. Prerequisite: ART 240. F.S.

ART 367. Intermediate Photography. 3 Credits.
An intermediate photography course designed to help the student develop self-direction abilities through a series of projects in consultation with the instructor. Projects involve the refinement of conceptual and formal qualities in silver or non-silver processes using film or digital techniques. Appropriate art safety instruction will be included. Repeatable to 6 credits. Prerequisite: ART 260 or ART 245 or ART 246 or consent of instructor. Repeatable to 6 credits. F.S, SS.

ART 370. Applied Visual Strategies. 3 Credits.
A studio/seminar course that examines conceptual practices in contemporary visual art and the relationship of those practices to art, artists and viewers within the western culture. The emphasis of the course will be on the application of these ideas and strategies through artistic production. Appropriate art safety instruction will be included. Prerequisite: Junior status. On demand.

ART 371. Fibres II. 3 Credits.
Coursework will consist of sample making and sustained projects woven on the loom. Techniques taught will include yarn dyeing. Appropriate art safety instruction will be included. F.

ART 380. Timebased Media II - Digital Video. 3 Credits.
Exploration of creative processes in digital video production. Students will acquire intermediate level knowledge of digital video and audio recording, sampling, sequencing, editing, manipulation. Selected readings on the historical, critical, and technical development of video art, sound and editing techniques will be included for in-class discussions. Appropriate art safety instruction will be included. Repeatable to 6 credits. Prerequisites: ART 112 and ART 272. Repeatable to 6 credits. F.S.
ART 381. Timebased Media III - Motion Graphics. 3 Credits.
Students will explore the integration of graphics, animation and video design. This class will focus on the the incorporation of graphics into video sequences, speed, timing and transformation of image. Students will become familiar with processing tools in color, size, placement modification, analysis and duplication of motion. Selected readings on the history of motion graphic art will be included for in-class discussions. Appropriate art safety instruction will be included. Repeatable to 6 credits. Prerequisites: ART 112, ART 272, and ART 380. Repeatable to 6 credits. F.

ART 382. Typography. 3 Credits.
The study and application of type. Examination of historical and contemporary typographic perspectives, including study of the structure and expressive nature of type as an integral element of graphic design. Prerequisites: ART 112, ART 114, and ART 130, or instructor consent. F, odd years.

ART 383. Timebased Media IV - Animation. 3 Credits.
Investigation in traditional and computergenerated animation. Students will explore character, experimental, stop motion, interactive, 3D computer animation and visual effects. Selected readings on technical development of digital effects in art will be included for in-class discussions. Appropriate art safety instruction will be included. Repeatable to 6 credits. Prerequisites: ART 112, ART 272, ART 380, and ART 381. Repeatable to 6 credits. On demand.

ART 397. Cooperative Education. 1-4 Credits.
Part-time, fall and spring, 1-3 credits, repeatable to 3 credits only. Full-time, fall, spring, and summer, 8 credits, not repeatable or interchangeable with part-time. Arranged by mutual agreement among student, Department and employer prior to enrollment. Special permission is required. Regular grading only. Prerequisite: Special permission is required. Repeatable to 8 credits. F, S, SS.

ART 400. Advanced Sculpture. 3 Credits.
Continued study of advanced sculpture process and concepts and emphasis on the development of individual artistic direction. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 301. Repeatable. F, S.

ART 401. Advanced Jewelry and Metalsmithing. 3 Credits.
A continuation and expansion of Jewelry and Metalsmithing II. Specialized techniques and processes utilized in metal fabrication will produce works ranging from body adornment to small sculpture. Emphasis will be placed on the theoretical and conceptual growth of the student and the development of a self-directed personal aesthetic expression. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 305. Repeatable. F, S.

ART 402. Advanced Painting. 3 Credits.
A continuation of Painting II. Further development of painting concepts, comprehension and research of various media and styles. The course stresses the focus of one’s attitudes towards developing a more personal visual statement in areas of personal interest. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 221. Repeatable. F, S.

ART 403. Advanced Printmaking. 3 Credits.
Advanced work in all traditional and experimental print media, including photo-based printing, non-toxic printing processes, computer-generated printmaking and exploration of collaborative printing and construction of non-traditional multiples. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 340. Repeatable. F, S.

ART 404. Advanced Ceramics. 3 Credits.
This course will have specific technical ceramic applications, applicable to the exploration of advanced level hand building and/or throwing techniques. The conceptual development of the student’s work is essential and may include both ceramic work and/or readings. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112 and ART 114 and ART 130, and ART 151 or ART 250, and ART 253, or consent of instructor. Repeatable. F, S.

ART 405. Advanced Photography. 3 Credits.
Refinement of conceptual and formal qualities in silver or non-silver process photography and exploration of advanced level hand building and/or digital techniques. The scope of work and media will be determined by contractual arrangements between the student and instructor. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, ART 260, and ART 261. Repeatable. F, S.

ART 406. Advanced Fibers. 3 Credits.
This course will involve the study and creation of fibers works in a range of media and techniques. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 277. Repeatable. F, S.

ART 408. Technical Ceramic Applications. 3 Credits.
Experience in specialized techniques and processes as they apply to ceramics, both new and traditional. Possible topics include, but are not limited to, ceramic sculpture-large scale or figurative, clay and glazes, kiln building, cone 6, mold making, raku and primitive firing and ceramic surface design. Appropriate art safety instruction will be included. Letter grade only. Repeatable as content changes. Prerequisites: ART 112, ART 114, ART 130, ART 151 or ART 250, ART 253, and ART 404, or consent of instructor. Repeatable. On demand.

ART 410. History of Art: Selected Topics. 1-4 Credits.
Study of varied topics in the history of art and architecture. May be repeated as title changes. Repeatable. F, S, SS.

ART 413. History of Graphic Design. 3 Credits.
Study of the political, cultural, aesthetic and technological influences of graphic design including the creative innovators who established graphic design as a profession. Prerequisites or Corequisites: ART 210, ART 211, Junior or Senior Standing, or instructor consent. S.

ART 415. History of Art: Museum Internship. 1-3 Credits.
The Museum Intern will work with the history of art faculty to select an exhibition to research, to prepare a written paper and to present publicly. Repeatable to 3 credits. F, S.

ART 416. History of Art: Renaissance and Baroque. 3 Credits.
Study of European art and architecture from the fourteenth to the eighteenth century. Prerequisites: ART 210 and ART 211. S, even years.

ART 417. History of Art: Museum Studies Practicum. 3 Credits.
Experience working in an art exhibition setting involving practical experience, research, a written paper and presentation. Prerequisites: ART 210 and ART 211. F, S.

ART 419. History of Art: Late18th through the19th Century Art. 3 Credits.
Study of the major artists and artistic movements from the French Revolution to Impressionism. Prerequisites: ART 210 and ART 211. F, odd years.

ART 423. History of Art: 20th and 21st Century. 3 Credits.
Study of artists, concepts, subjects, styles, media, and artistic processes from c. 1900 to the present. Prerequisites: ART 210 and ART 211. F.

ART 424. History of Art: Non-Western Traditions. 3 Credits.
Study of art outside European traditions. Course topics will rotate to include the art of Asia, Africa, Oceania, and Native arts of the Americas. Prerequisites: ART 210 and ART 211. S, odd years.

ART 430. Advanced Drawing. 3 Credits.
Further development of drawing concepts, comprehension, and search of various media, and styles. The course stresses the focus of one’s attitude towards developing a more personal visual statement in areas of personal interest. Appropriate art safety instruction will be included. May be repeated for credit without limitation. Prerequisites: ART 112, ART 114, ART 130, and ART 230. Repeatable. F, S.

ART 460. Methods, Materials and Philosophy: Art in the Elementary Classroom. 3 Credits.
The study of art materials, methods, philosophy and projects applicable for special education, kindergarten through sixth grade students. Emphasis is on inter-curricular creativity using both 2-dimensional and 3-dimensional projects, featuring multi-cultural and disciplined-based education. Appropriate art safety instruction will be included. Prerequisite: Sophomore standing in TL or Art. F, S.

ART 461. Methods and Materials of Teaching Middle and Secondary School Art. 3 Credits.
ART 480. Advanced Graphic Design. 3 Credits.
Study and application of abstract representation in graphic design. Design methods and genres are examined during the production of promotional material including identity and business systems and campaigns. Ability to work metaphorically with image and design will be stressed. Focus will be on layout and composition. Continuing students will focus on application of graphic design principles to environmental and three-dimensional material including packaging, showroom graphics, display and electronic media applications. Appropriate art safety instruction will be included. Repeatable. Prerequisites: ART 112, ART 114, ART 130, and ART 273, or instructor consent. Repeatable. F.S.

ART 481. Graphic Design Internship. 3 Credits.
Supervised work experience in graphic design. Plan submitted by student and approved in advance by faculty and on-site supervisor. Final report, portfolio of work produced during internship, and employee evaluation required. Prerequisites: ART 114, ART 273, ART 480, senior standing and instructor consent. F.S.S.

ART 483. Advanced Timebased Media: Alternative Presentation of Media. 3 Credits.
Exploration of contemporary presentation methods and concepts in Animation and time-based digital media. Emphasis on the development of personal aesthetic and conceptual development. Historical, critical, and technical readings will be included for in-class discussions. Appropriate art safety instruction will be included. Prerequisites: ART 112, ART 272, ART 380, ART 381, and ART 383. On demand.

ART 490. Special Projects/Independent Research. 1-6 Credits.
Advanced independent study within a specific art discipline outside of subject areas normally covered within regularly scheduled courses in studio art, graphic design, art history and art education. Formal contract must be signed with professor of record. Repeatable, no more than 6 credits in each discipline area. Prerequisites: Senior standing and permission of instructor. Repeatable to 12 credits. F.S.S.

ART 491. Special Topics. 3 Credits.
Experience in specialized techniques and processes as they apply to various media both new and traditional. Offered on request. May be conducted either on laboratory or tutorial basis as subject matter permits. Appropriate art safety instruction will be included. Prerequisite: Upper division status. Repeatable. F.S.

ART 494. Professional Exhibition. 3 Credits.
This course is designed to give B.F.A. candidates a summary experience and to serve as a benchmark in their artistic and professional development. The B.F.A. exhibition should represent focused study in the candidate’s area(s) of concentration. Appropriate art safety instruction will be included. Prerequisite: Permission of advisor. S.

ART 498. Seminar in Art and Design Capstone. 3 Credits.
Discussions, reports, and presentations that analyze, synthesize and evaluate various topics derived from what students have learned in the Art Design program in relation to their entire university experience. Emphasis on critical thinking will be demonstrated through written and oral communication. Prerequisites: Senior Standing and ART 112, ART 130, ART 210, and ART 211. S.

Minor In Canadian Area Studies
Housed in the College of Arts and Sciences, this is an interdisciplinary 20-credit minor in Canadian Area Studies. There are three required courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GEOG 362</td>
<td>Geography of Canada</td>
<td>3</td>
</tr>
<tr>
<td>HIST 204</td>
<td>Canada to 1867</td>
<td>3</td>
</tr>
<tr>
<td>or HIST 205</td>
<td>Canada since 1867</td>
<td></td>
</tr>
<tr>
<td>A&amp;S 252</td>
<td>Introduction to Canadian Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

At least 6 additional credits must be taken at the upper-division level.

Students will be able to choose an area of concentration from among the following:

French Canada (for the student with sufficient background in the French language), total 20 hours.

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FREN 307</td>
<td>A Social and Cultural History of Québec</td>
<td>3</td>
</tr>
<tr>
<td>FREN 373</td>
<td>North American Francophone Cultures through Literature and Film</td>
<td>3</td>
</tr>
<tr>
<td>FREN 494</td>
<td>Individual French Readings</td>
<td>1-3</td>
</tr>
<tr>
<td>HIST 300</td>
<td>Topics in History (History of the Canadian West)</td>
<td>1</td>
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</tbody>
</table>

Required Courses 9

Any combination of courses from the approved list (see below)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>IS 250</td>
<td>Lakota Language I</td>
<td>3</td>
</tr>
<tr>
<td>IS 251</td>
<td>Lakota Languages II</td>
<td>3</td>
</tr>
<tr>
<td>IS 350</td>
<td>Native American Languages</td>
<td>3</td>
</tr>
<tr>
<td>IS 201</td>
<td>History of the Sioux</td>
<td>3</td>
</tr>
<tr>
<td>IS 203</td>
<td>History of the Ojibwe</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 377</td>
<td>North American Archaeology</td>
<td>3</td>
</tr>
<tr>
<td>HIST 399</td>
<td>Selected Topics in History (when applicable)</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Required Courses 9

General,

Any of the above listed courses 11-12

Required Courses 9

Courses which carry credit for the Canadian Area Studies minor:

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ANTH 377</td>
<td>North American Archaeology</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;S 251</td>
<td>Study in Canada</td>
<td>1-12</td>
</tr>
<tr>
<td>A&amp;S 252</td>
<td>Introduction to Canadian Studies</td>
<td>3</td>
</tr>
<tr>
<td>IS 250</td>
<td>Lakota Language I</td>
<td>3</td>
</tr>
<tr>
<td>IS 251</td>
<td>Lakota Languages II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 367</td>
<td>American Indian Literatures</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 415</td>
<td>Seminar in Literature</td>
<td>3</td>
</tr>
<tr>
<td>FREN 307</td>
<td>A Social and Cultural History of Québec</td>
<td>3</td>
</tr>
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<td>North American Francophone Cultures through Literature and Film</td>
<td>3</td>
</tr>
<tr>
<td>FREN 494</td>
<td>Individual French Readings</td>
<td>1-3</td>
</tr>
<tr>
<td>GEOG 262</td>
<td>Geography of North America I</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 362</td>
<td>Geography of Canada</td>
<td>3</td>
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<tr>
<td>GEOG 462</td>
<td>Geography of North America II</td>
<td>3</td>
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<tr>
<td>HIST 204</td>
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<td>HIST 300</td>
<td>Topics in History (History of Quebec)</td>
<td>1</td>
</tr>
<tr>
<td>HIST 300</td>
<td>Topics in History (History of the Canadian West)</td>
<td>1</td>
</tr>
<tr>
<td>HIST 399</td>
<td>Selected Topics in History (when applicable)</td>
<td>2-3</td>
</tr>
<tr>
<td>HIST 421</td>
<td>The British Empire, 1496-1884</td>
<td>3</td>
</tr>
<tr>
<td>HIST 422</td>
<td>The British Empire and Commonwealth, 1884-the Present</td>
<td>3</td>
</tr>
</tbody>
</table>

Arts and Sciences (A & S)

http://www.arts-sciences.und.edu

The College of Arts and Sciences offers a limited number of non-departmental courses. Among these are A&S 299 Special Topics and A&S 499 Special Topics. They provide for on-demand courses in areas of particular relevance when students or faculty members wish to initiate them. They can provide special-interest courses for particular groups of students. They can serve as a curricular laboratory for experimental courses which may later be established as regular offerings within departments or programs. Students and faculty members wishing to initiate course offerings under A&S 299, Directed Studies, A&S 299 Special Topics, and A&S 499 Special Topics should present their proposals in writing to the Dean of the College. See the Arts and Sciences website (http://www.und.edu/dep/artssci) for the appropriate A&S course request forms.
Courses

A&S 100. Introduction to Peer Mentoring. 1 Credit.
This seminar will serve as an introduction to the Peer Mentor program in the College of Arts Sciences and will include needed training modules for that program. Prerequisite: Successful application to the College of Arts Sciences Peer Mentor program; must obtain permission number from instructor: SS.

A&S 250. Arts & Sciences. 1-4 Credits.
Repeatable to 21 credits.

A&S 251. Study in Canada. 1-12 Credits.
One to twelve credits in any one semester (repeatable with permission of the student’s academic department); a course load required to maintain full-time status; at least Sophomore status required; GPA of at least 2.50; must become familiar with Canadian study procedures, application, credit transfer and other matters as outlined in the Study Abroad Handbook; courses to be taken during a study in Canada must have pre-approval from student’s academic department. Prerequisites: Sophomore status or higher and a GPA of 2.5 or higher. Repeatable. F,S,SS.

A&S 252. Introduction to Canadian Studies. 3 Credits.
An interdisciplinary, team-taught course focusing on the historical, geographical, socio-cultural, literary, political, economic, and international qualities that make Canada and its communities both vibrant and unique. F.

A&S 294. Directed Studies. 1-4 Credits.
Specially arranged individual tutorials, projects, or reading programs on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. Repeatable as topics vary to 8 credits. Repeatable to 8 credits.

A&S 299. Special Topics. 1-4 Credits.
Specially arranged seminars or courses on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. Repeatable. On demand.

A&S 351. Introduction to Law and Legal Studies. 3 Credits.
Segments on Contracts, Criminal Law, Constitutional Law, and Torts, taught in customary law school manner to acquaint undergraduates and others interested in exploring a career in the legal profession with law school methodology and legal analysis.

A&S 497. Internship. 1-4 Credits.
This internship is a short-term work experience emphasizing hands-on learning that is not covered by regular departmental offerings. Prerequisite: Permission of instructor. Repeatable to 12 credits. F,S,SS.

A&S 499. Special Topics. 1-4 Credits.
Specially arranged seminars or courses on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. Repeatable. On demand.

Facilities

The Department of Atmospheric Sciences has several unique research and teaching facilities. Four primary research facilities are used in national and international research programs: a C-band dual-polarization Doppler weather radar; a surface transportation weather test site; an atmospheric and hydrologic observations ground site; and a Cessna Citation II research jet (through an agreement with a private company). Teaching facilities include laboratories for use in cloud physics and instrumentation and a high performance computing cluster. The Regional Weather Information Center supports weather analysis and forecasting classes, along with operational research efforts. Current research areas include clouds and climate change, ground/satellite remote sensing, atmospheric aerosols, radar meteorology, mesoscale numerical modeling, atmospheric transport, data assimilation, and surface transportation weather. Students also have the opportunity to produce and broadcast weather segments for cable television and the Internet.

B.S. in Atmospheric Sciences

Requires 125 credits (36 of which must be number 300 or above, and 60 of which must be from a 4-year institution) including:
I. Essential Studies Requirements (see University ES listing).
II. Center for Aerospace Sciences requirements, see Aerospace Sciences (p. 605) listing.
III. The Following Curriculum:

Freshman Year
First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ATSC 100</td>
<td>Atmospheric Sciences Orientation</td>
<td>1</td>
</tr>
<tr>
<td>ATSC 110</td>
<td>Meteorology I *</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory *</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>Essential Studies</td>
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<tr>
<td>Free Electives</td>
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<tr>
<td><strong>Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 130</td>
<td>Introduction to Scientific Programming</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies</td>
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<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td></td>
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<tr>
<td><strong>Credits</strong></td>
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Sophomore Year
First Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 210</td>
<td>Introduction to Synoptic Meteorology *</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHYS 252</td>
<td>University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L and General Chemistry I Laboratory</td>
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</tbody>
</table>

Athletic Training

(See Family Medicine (http://und-public.coursera.com/ undergraduateacademicinformation/departmentalcoursesprograms/familyandcommunitymedicine) listing)

Atmospheric Sciences (AtSc)

http://www.atmos.und.edu/

Askelson, Borho, Gilmore, Kennedy, Mullendore, Osborne, Poellot (Chair), Remer and Zhang

The Department of Atmospheric Sciences offers a comprehensive education in the atmospheric sciences leading to the degree of Bachelor of Science in Atmospheric Sciences and the Master of Science and Doctor of Philosophy degrees (see School of Graduate Studies (p. 623) listing). The degree is awarded in the John D. Odegard School of Aerospace Sciences. A minimum of a 2.50 GPA is required for graduation. The degree is designed to prepare graduates for professional careers in applied meteorology or for graduate studies.

New students who wish to declare a major in Atmospheric Sciences are first enrolled in the pre-professional program, Pre-Atmospheric Sciences (Pre-AtSc), which is a set of preparatory courses that includes Math 166 (Calculus II), Physics 251 (University Physics I), and AtSc 210 (Introduction to Synoptic Meteorology). Once a student has completed these courses, they may change their major to Atmospheric Sciences (AtSc).
| Junior Year | First Semester | ATSC 240 Meteorological Instrumentation | 4 |
| Multi Semester | ATSC 270 Computer Concepts in Meteorology | 3 |
| | Credits | 15 |
| Second Semester | MATH 266 Elementary Differential Equations | 3 |
| | ATSC 345 Remote Sensing of the Atmosphere | 3 |
| | ATSC 350 Atmospheric Thermodynamics | 3 |
| | PHIL 250 Ethics in Engineering and Science | 3 |
| | Career Electives | 4 |
| | Credits | 16 |
| Senior Year | ATSC 405 Numerical Methods in Meteorology | 3 |
| | ATSC 411 Synoptic Meteorology | 4 |
| | ATSC 492 Senior Project | 1 |
| | Credits | 16 |
| Second Semester | ATSC 497 Internship | 1-8 |
| | Total Credits | 125 |

* Career Electives are courses that students take to gain additional knowledge and skills that would allow them to develop their chosen career interest. A total of 12 credit hours are required from an approved list of classes. Only one lower level Atmospheric Sciences course will be allowed as a Career Elective.

# A maximum combined limit of 6 credit hours of ATSC 397 Cooperative Education, and ATSC 497 Internship, may be used as Career Electives.

\* Grade of ‘C’ or higher required.

### Minor in Atmospheric Sciences

Requires 20 credits including:

| ATSC 110 Meteorology I | 3 |
| ATSC 110L Meteorology I Laboratory | 1 |
| ATSC 210 Introduction to Synoptic Meteorology | 4 |
| ATSC 310 Introduction to Weather Forecasting | 3 |
| Atmospheric Science Electives | 9 |
| Total Credits | 20 |

The following courses may not count towards the Atmospheric Sciences Electives for the minor:

| ATSC 100 Atmospheric Sciences Orientation | 1 |
| ATSC 120 Severe and Hazardous Weather | 3 |
| ATSC 397 Cooperative Education | 1-8 |
| ATSC 494 Special Studies in Meteorology | 1-4 |

### Courses

**ATSC 100. Atmospheric Sciences Orientation. 1 Credit.**
This course is required for all atmospheric sciences majors. Its purpose is to prepare new students for their university and professional careers by discussing university policies, the advising process, and career options. S/U grading. F.

**ATSC 110. Meteorology I. 3 Credits.**
Elements of the atmosphere with emphasis on those processes that affect the global atmospheric circulation. Includes laboratory. Corequisite: ATSC 110L. F.S.

**ATSC 110L. Meteorology I Laboratory. 1 Credit.**
Laboratory to accompany ATSC 110. Corequisite: ATSC 110. F.S.

**ATSC 120. Severe and Hazardous Weather. 3 Credits.**
A survey of extreme weather events, their impact on society, and the technology used in their detection and forecasting. F.

**ATSC 210. Introduction to Synoptic Meteorology. 4 Credits.**
The analysis and portrayal of synoptic weather information. Kinematic flow analyses of barotropic and baroclinic systems. Introduction to many of the products produced by NWS. Includes laboratory. Prerequisites: ATSC 110 and MATH 146 or MATH 165. F.

**ATSC 231. Aviation Meteorology. 4 Credits.**
A study of weather hazards, meteorological flight planning, aviation weather equipment and human factors in weather flying safety. Prerequisite: ATSC 110. F.S.

**ATSC 240. Meteorological Instrumentation. 4 Credits.**
A study of the theory, design, and accuracy of instrumentation for the measurement of temperature, pressure, humidity, wind, and radiation. In addition, topics such as radar, and the use of aircraft and balloons as instrument platforms are also discussed. Includes laboratory. Prerequisites: ATSC 110 and MATH 103. S.

**ATSC 252. Applied Weather Modification. 4 Credits.**
Provides a comprehensive introduction to basic concepts of weather modification as currently practiced around the world. It includes a study of cloud physics and seeding theory, a review of past and current programs, and a discussion of related legal, societal, economic and environmental issues. Provides students exposure to the practical aspects of weather modification operations, including program design and evaluation, care and use of seeding materials and equipment, identification of seeding opportunities, and airborne delivery of seeding materials. Prerequisite: ATSC 110. S.

**ATSC 270. Computer Concepts in Meteorology. 3 Credits.**
The course introduces students to the programming knowledge needed for manipulating observational and model data in the earth sciences. Topics include data visualization, Linux and shell scripting, advanced file I/O, and memory management. The example problems utilize datasets commonly found in the atmospheric sciences. Prerequisites: ATSC 110 and CSCI 130. S.

**ATSC 310. Introduction to Weather Forecasting. 3 Credits.**
An operations approach to application of practical methodologies of weather analysis using computer textual and graphic analysis systems. Involves routine weather laboratory activities commonly found within the operational sector of meteorology. Prerequisite: ATSC 210. S.

**ATSC 315. Broadcast Meteorology. 3 Credits.**
An introduction to the field of broadcast meteorology which provides an overview of television production, the profession of broadcast meteorology, AMS Seal requirements, ethics and the production, organization, critique, and presentation of weather information. Prerequisites: ATSC 310 and Communication or Atmospheric Sciences major. F, even years.

**ATSC 345. Remote Sensing of the Atmosphere. 3 Credits.**
Fundamental remote sensing concepts and tools including fundamental radiative processes in the atmosphere. Principles and applications of satellite and radar and their uses as meteorological observation and research tools. Additional instruments may be discussed including lidar, wind profilers, radio acoustic profilers, and other profiling systems. Prerequisites: ATSC 210 and MATH 166. F.
ATSC 350. Atmospheric Thermodynamics. 3 Credits.
An introduction into the theory and application of atmospheric thermodynamics used in synoptic, meso- and microscale meteorology. The course covers the principles of classical thermodynamics and how they are applied to atmospheric processes. Prerequisites: ATSC 270, MATH 166, and PHYS 251. F.

ATSC 353. Physical Meteorology. 3 Credits.
A study of atmospheric processes and properties from a physical standpoint. Includes atmospheric radiation, aerosols, cloud microphysics, and climate dynamics. Prerequisite: ATSC 345. S.

ATSC 355. Surface Transportation Weather I. 3 Credits.
An introduction to the concepts, practices and methodologies used in the surface transportation weather industry. Includes configuration, siting, and data management/quality control of environmental sensor stations, fundamentals of surface transportation weather forecasting, overview of winter road maintenance methods, and applications of geographical information systems technologies in a weather and road maintenance environment. Prerequisites: ATSC 210 and ATSC 240. F, odd years.

ATSC 360. Dynamic Meteorology. 4 Credits.
Basic equations of motion, atmospheric thermodynamics, balanced motions, and atmospheric disturbances are examined on an introductory level. Prerequisite: ATSC 350 or Corequisite: MATH 266. S.

ATSC 397. Cooperative Education. 1-8 Credits.
The student will receive credit for on-the-job compensated work experience in various areas of meteorology available within the government, university or private sectors. May be repeated to a total of 12 credits. Prerequisites: Overall GPA of 2.5 or higher and approval of the Coordinator of Atmospheric Sciences cooperative education. Repeatable to 12 credits. S/U grading. F,S,SS.

ATSC 405. Numerical Methods in Meteorology. 3 Credits.
This course is designed to introduce students to numerical methods used to solve mathematical problems that are difficult to solve analytically. The course is designed to focus on numerical problems encountered in the field of atmospheric science. Prerequisites: ATSC 360 and MATH 266. F.

ATSC 411. Synoptic Meteorology. 4 Credits.
Development and application of quasi-geostrophic theory, including its application to the development and propagation of surface and upper-level systems, isentropic analysis, IPV theory, fronts, jets, and the relation between the synoptic environment and convection. Includes a laboratory in which concepts are reinforced through map discussion, map analysis, forecasting exercises and forecasting techniques. Prerequisites: ATSC 210 and ATSC 360. F.

ATSC 441. Radar Meteorology. 4 Credits.
Advanced radar theory, including basic radar principles, digital processing of radar signals. Doppler radar principles, displays, polarization techniques, and characteristic returns. Includes laboratory. Prerequisite: ATSC 345 or consent of instructor. S, odd years.

ATSC 450. Introduction to Cloud Physics Meteorology. 4 Credits.
A study of the physics of clouds with emphasis on microphysical processes involved in cloud formation, precipitation production, and dissipation. Includes Laboratory. Prerequisites: ATSC 350 and ATSC 353. F, odd years.

ATSC 455. Surface Transportation Weather II. 3 Credits.
An in-depth exploration of surface transportation meteorology designed to prepare students for a career in operational surface transportation meteorology. Includes application of mesoscale weather prediction models in a surface transportation environment, introduction to pavement condition modeling, forecast verification methods, and an introduction to methods of maintenance decision-making. Prerequisites: ATSC 310 and ATSC 355. S, even years.

ATSC 456. Introduction to Professional Meteorology. 3 Credits.
A survey of the structure and methods found within the operational and private sector weather community. Provide orientation of professional meteorology methods. While the government sector of operational meteorology will be discussed, the emphasis of the course will focus on aspects of private sector meteorology. Prerequisite: ATSC 310. Corequisite: ATSC 411. F, odd years.

ATSC 460. Mesoscale Dynamics. 4 Credits.
An introduction to mesoscale dynamics and forecasting. Topics include mesoscale circulations, warm and cold season weather systems, terrain induced weather systems, tropical systems and mesoscale models. Prerequisite: ATSC 360. S.

ATSC 492. Senior Project. 1-2 Credits.
A capstone project demonstrating a breadth and depth of knowledge in atmospheric sciences. An original student investigation of a topic to be selected in consultation with a supervising faculty member of the department. Students will demonstrate the ability to communicate their research through both oral and written communication at an advanced level. Must be repeated for a total of 3 credits. Prerequisites: Senior Standing in Atmospheric Sciences and consent of advisor. Repeatable to 3 credits. S/U grading. F,S.

ATSC 494. Special Studies in Meteorology. 1-4 Credits.
Designed for those students who wish to pursue advanced topics in meteorology on an individual basis. May be repeated with change of subject matter to a maximum of four credit hours. Prerequisites: Upper division status and consent of the instructor. Repeatable to 4 credits. F,S,SS.

ATSC 497. Internship. 1-8 Credits.
Field experiences in various areas of meteorology will be offered as available. May be repeated up to a total of 12 credits. Prerequisite: Permission of instructor and dean. Repeatable to 12 credits. S/U grading. F,S,SS.

ATSC 499. Topics in Meteorology. 2-4 Credits.
This course will cover one or more topics in meteorology of special interest to upper division students. Course may be repeated up to a maximum of 6 credits. Prerequisite: Consent of instructor. Repeatable to 6 credits. F,S.

Aviation (Avit)
http://www.avit.und.edu/Home/Default.aspx

Declaring a Major or Minor
Aviation
A student pursuing a degree program in aviation may choose to be admitted as a Commercial Aviation, Air Traffic Management, Aviation Technology Management, Unmanned Aircraft Systems Operations, or Flight Education student. The student's declared major or minor may be changed by submitting a Change of Major form to Student Services, Odegard Hall, Room 200.

Business
A student pursuing a degree program in business will be admitted to the College of Business and Public Administration as a Pre-Aviation Management
or Pre-Airport Management student. In order to be fully admitted to the degree program, a student must have:

1. Satisfactorily completed the specified freshman/sophomore Pre-Business courses.
2. Earned at least a 2.50 overall GPA in all courses taken.
3. Completed the following Pre-Business Core courses with no grade lower than “C.”

<table>
<thead>
<tr>
<th>Pre-Business Core courses</th>
<th>Credit hours</th>
</tr>
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<tbody>
<tr>
<td>ACCT 200 &amp; ACCT 201</td>
<td>6</td>
</tr>
<tr>
<td>ECON 201 &amp; ECON 202</td>
<td>9</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>3</td>
</tr>
</tbody>
</table>

Further information on the business degree can be obtained by contacting the Office of Academic Advisement, College of Business and Public Administration, Gamble Hall, Room 127, at 701-777-2975 or advising@business.und.edu

Regardless of which degree program is selected, in order to take 300-level and above aviation courses, students must have declared an aviation major or minor or have received special permission from the instructor of the course.

**Minimum Grade Point Average (GPA)**

Aviation students (including transfers) enrolling in aviation courses must maintain a minimum Grade Point Average (GPA) of 2.50 (both cumulative and institutional) to enroll in AVIT 102-Introduction to Aviation or AVIT 142-Introduction to Aviation-Helicopter, and all 200-level and above aviation courses. Students who fall below this minimum GPA are subject to withdrawal from those courses by the Aviation Department. Incoming freshmen without previous college credit are not subject to this requirement but are strongly advised to meet with an Aviation Department advisor prior to enrolling in any aviation course.

**Academic Advising**

All aviation students are assigned an academic advisor and are encouraged to visit with their advisor on a regular basis. Freshmen students (less than 24 completed credits), students with GPAs below 2.50, and students who received an Academic Deficiency are required to meet with their advisor prior to semester registration and will be placed on Advisor Hold until doing so.

**Attendance**

Aviation students are required to regularly attend all academic aviation classes in accordance with the intent and spirit of the policy set forth by the University of North Dakota. Attendance is mandatory with respect to satisfying ground school requirements in all 14 CFR Part 141 flight courses. Failure to meet attendance requirements will disqualify a student for FAA pilot or flight instructor certification.

**Lesson Completion**

Students enrolled in flight courses are required to finish those flight lessons prescribed for each individual course in order to complete the course. Failure to complete the flight lessons within an acceptable time frame, as stated in the applicable course syllabus or Training Course Outline (TCO), will result in an unsatisfactory grade.

**Technology in the Classroom**

Many Aviation instructors utilize computer technology in the classroom to conduct learning activities, including online assessments, exams, student portfolios, and accessing the web for supporting information. Aviation students are expected to provide their own personal electronic devices for this purpose.

**Transfer of College Credit/Certificates and/or Ratings**

Undergraduate aviation programs, accredited through the Aviation Accreditation Board International, normally concentrate on essential studies courses during the first two years of a four-year program. Only a limited amount of aviation coursework is offered below the junior level. The objective of this policy is to permit the student to acquire a foundation of work in the basic arts and sciences as a prerequisite for professional coursework in aviation.

Students planning to take their first two years of work at a junior college should concentrate their efforts in completing the essential studies coursework.

The University of North Dakota’s Department of Aviation bases its flight education philosophy on a four-year university degree. Consequently, students who have obtained flight certificates/ratings, with or without college credit, may not have satisfied the academic and flight requirements specified for the aviation major that they are pursuing. All aviation courses being transferred to UND, flight or non-flight, are reviewed by the Aviation Department for transferability. It is the responsibility of the student to initiate a review of transfer courses. Questions about the transferability of courses, please contact the Aviation Department, Student Services, at 1-800-258-1525 or write to: Student Services, John D. Odegard School of Aerospace Sciences, 3980 Campus Road, Grand Forks, North Dakota 58202-9007. Students may e-mail UND Aerospace at: fly.und@aero.und.edu (fly.und@aero.und.nodak.edu).

**UND Flight Training Policy**

Regardless of academic major, once a student has enrolled at UND, all subsequent flight training required as part of a student’s course of study, must be completed in residence at UND. Flight training completed away from UND will not be granted credit for the corresponding UND course.

The Aviation Department does not allow concurrent enrollment in required flight courses.

Non-U.S. citizens are not eligible to enroll in UND flight training courses that require completion of the Transportation Security Administration (TSA) Alien Flight Student Program until they receive permission to initiate training from TSA.

**Medical Certificates**

A current medical certificate is required for all students prior to beginning flight training. The physical examination must be performed by a physician who is designated as an Aviation Medical Examiner (AME).

There are three types of medical certificates—Class I, Class II, and Class III. Students are advised to get a Class II certificate if they are planning to pursue a career as a professional pilot. Any physical limitation which may alter career plans should become evident at that time. Students over the age of 35 should consider obtaining a Class I medical certificate.

Students are encouraged to make plans to obtain their medical certificates six months before they will begin flight training at UND. This will ensure that any problems can be addressed before the student enrolls in a flight training course.

**Alcohol and Drug Program Participation**

The John D. Odegard School of Aerospace Sciences is committed to the highest aviation safety standards. In accordance with the School’s safety culture, a “no tolerance” policy regarding the use of drugs and alcohol has been implemented. As a result, all students taking part in flight training at UND will be required to participate in a drug and alcohol testing program. This program runs continuously throughout the year for all flight students. Please refer to http://aviation.und.edu for more information on medical certificates and the drug and alcohol testing program.

**Aviation Department, Program, or Course-Specific Fees**

Flight costs are not included in university tuition or fees. They are determined on an hourly basis for aircraft and flight instruction, and are in addition to tuition, fees and any other incidental expenses which are normally charged during registration. Flight costs may be added to the estimated cost of attendance that is used to determine financial aid eligibility if the student is a declared aviation major (commercial aviation, air traffic management, aviation technology management, unmanned aircraft systems operations, or flight education) or
a pre-airport management or pre-aviation management major through the College of Business and enrolled in a flight course required for those majors.

Students enrolling in flight courses are required to deposit money into their flight accounts on a regular basis, and to keep a positive balance, to cover their flight costs. Deposits are made at the Student Account Services office or on-line through the student Campus Solutions access. Students will not be permitted to fly if their minimum balance drops below $200. It is the responsibility of each student to have a known source of income prior to enrolling in any flight training-related curriculum.

An Altitude Chamber Fee of $175 and a $65 Spatial Disorientation Trainer Fee will be charged to aviation students who use the altitude chamber as part of AVIT 309 Flight Physiology.

An Air Traffic Management (ATM) program fee or course fee will be charged to aviation students who declare Air Traffic Management as their major or enroll in certain ATM classes.

Students enrolled in AVIT 428 Transport Category Aircraft Systems will be charged a $275 course fee for access to the computer based Virtual Flight Deck.

Additional John D. Odegard School of Aerospace Sciences program fees or course fees may be charged to students enrolled in any of the aviation degree program courses. Students are cautioned to note that fees are subject to change, and they should consult with their academic advisor, student services advisors, or the applicable program cost sheets for the latest information. Please refer to http://aviation.und.edu for more information on program fees.

Students receiving financial assistance through the Veterans Administration (VA) should be aware that the VA will only fund minimum training requirements and students must cover additional training costs. Students may contact Veteran & Nontraditional Student Services for an explanation of VA-covered expenses. Their email address is UND.veteranservice@UND.edu.

**Financial Aid Information**

Students are encouraged to explore all financial aid options as outlined in the General Information section of this catalog. In addition to these forms of aid, the Aviation department provides endowed and non-endowed scholarships for qualifying students each year. All aviation students, including freshmen and new transfer students, are eligible to apply. An online scholarship application process is available during the spring semester. Specific instructions can be found at http://aviation.und.edu/current-students/employment/scholarships.aspx

In addition to the online scholarships that are available in the spring, short notice scholarships often become available throughout the academic year. Students are encouraged to check the website periodically for the latest scholarship information.

Financial aid is available only for those flight courses required as part of a student’s declared program. Students are encouraged to obtain additional ratings, endorsements, or experience; however, they are individually responsible for the expenses incurred.

**Program Descriptions**

The **Aviation Management** curriculum is offered to those students whose career objectives are aimed toward the management and operation of the flight-related activities of the aviation industry. Emphasis is placed on applying modern management practices to the airline, airport, and general aviation management professions. A **Commercial Pilot Certificate**, with instrument and multi-engine ratings, is required.

The **Airport Management** curriculum is offered to those students seeking administrative positions with companies specializing in or related to the ground activities of the aviation industry. Foundational aspects of the general aviation and air carrier segments, as well as the overall aviation industry will be studied in-depth. However, sufficient flexibility in courses will allow the student to concentrate in a particular area of the industry such as general aviation operations, airline management, airport administration, or corporate aviation management. Completion of either AVIT 102 Introduction to Aviation or AVIT 142 Introduction to Aviation-Helicopter is required.

The **Commercial Aviation** curriculum provides a student with the educational foundation necessary for entry-level pilot positions within the aviation industry. All students pursuing this degree will take core aviation courses to build fundamental knowledge but will choose either the airplane or helicopter options for their flight training. Each option requires completion of the **Commercial Pilot Certificate** and instrument rating plus additional advanced flight courses as described in the expanded program description.

The **Flight Education** curriculum is designed for students interested in aviation education as a profession. Flight Education combines a solid background in aviation and vocational education with a Certified Flight Instructor Certificate, including appropriate ratings. This major provides a student with the educational foundation necessary to teach aviation courses in a vocational setting or community college, or to pursue graduate study. Students interested in teaching at the college level should obtain a master’s degree and a terminal doctoral degree in aviation or other complementary disciplines. Completion of either Commercial Pilot Certificate, with instrument and multi-engine ratings, plus the Certified Flight Instructor Certificate, with airplane, instrument, and multi-engine ratings, are required.

The **Air Traffic Management** curriculum prepares students for careers as ground-based controllers who direct aircraft through the National Airspace System (NAS). In addition to the primary curriculum, this program requires a second field of study, which normally means a formal minor, aviation specialization, or a second major. Completion of either AVIT 102 Introduction to Aviation or AVIT 142 Introduction to Aviation-Helicopter is required. A non-certificate granting flight option is also available.

The **Aviation Technology Management** curriculum is an opportunity for students with an already existing technical aviation background to expand their knowledge of the aerospace industry and obtain a Bachelor’s degree.

Admission to this program requires previous completion of an approved aviation technical program with certification. Completion of either AVIT 102 Introduction to Aviation or AVIT 142 Introduction to Aviation-Helicopter is required. A non-certificate granting flight option is also available.

The **Unmanned Aircraft Systems Operations** curriculum is offered to those students pursuing careers within the civil unmanned aircraft systems industry. The program prepares graduates for employment as pilots/operators and/or developmental team members of unmanned aircraft systems (UAS) who fully understand the operational and safety environments of the National Airspace System. Courses require students to be comfortable utilizing complex science, technology, engineering and mathematics principles. A Commercial Pilot Certificate, with instrument and multie engine ratings is required. As some of the technologies involved with UAS fall under export control laws, students wishing to pursue this degree must be able to prove United States citizenship prior to enrolling in the following UAS courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AVIT 238</td>
<td>UAS Operator Certification 3</td>
<td></td>
</tr>
<tr>
<td>AVIT 331</td>
<td>UAS Flight Systems 3</td>
<td></td>
</tr>
<tr>
<td>AVIT 332</td>
<td>UAS Ground Systems 3</td>
<td></td>
</tr>
<tr>
<td>AVIT 333</td>
<td>UAS Remote Sensing 4</td>
<td></td>
</tr>
<tr>
<td>AVIT 337</td>
<td>Survey of Unmanned Aircraft Systems 2</td>
<td></td>
</tr>
<tr>
<td>AVIT 438</td>
<td>UAS Operations 4</td>
<td></td>
</tr>
</tbody>
</table>

There are no exceptions to this policy.

**Note:** The Aviation faculty strongly recommend that Aviation students pursue a minor, an aviation specialization, or a second major in another discipline.

B.B.A. with a Major in Aviation Management (p.)  B.S. in Aeronautics with a Major in Air Traffic Management (p.)  B.S. in Aeronautics with a Major in Aviation Technology Management (p.)  B.S. in Aeronautics with a Major in Commercial Aviation (p.)  B.S. in Aeronautics with a Major in Flight Education (p.)  B.S. in Aeronautics with a Major in Unmanned Aircraft Systems Operations (p.)

**College of Business and Public Administration**

**B.B.A. with a Major in Airport Management**

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must from a 4-year institution) including:

University of North Dakota
I. Essential Studies Requirements (see University ES listing).

II. College of Business and Public Administration Requirements (see College section).

III. The following curriculum:

**Pre-Business Curriculum**

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<td>Introduction to Business and Economic Statistics</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>Arts and Humanities Electives</td>
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</tr>
</tbody>
</table>

Select one of the following:

- ANTH 171 Introduction to Cultural Anthropology
- PSYC 111 Introduction to Psychology
- SOC 110 Introduction to Sociology

**Aviation Courses**

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<td>Aviation Orientation</td>
<td>1</td>
</tr>
<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 103</td>
<td>Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
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<tr>
<td>AVIT 250</td>
<td>Human Factors</td>
<td>2</td>
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<tr>
<td>AVIT 311</td>
<td>Safety Management System (SMS)</td>
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<tr>
<td>AVIT 402</td>
<td>Airport Planning and Administration</td>
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<tr>
<td>AVIT 403</td>
<td>Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 442</td>
<td>Airport Operations and Administration</td>
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</tr>
<tr>
<td>AVIT 485</td>
<td>Aviation Senior Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- AVIT 405 Airline Operations and Management
- AVIT 407 General Aviation Operations and Management

**Advanced Business Courses**

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
<td>3</td>
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<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
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<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
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<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
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<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- GEOG 474 Introduction to Geographic Information Systems (GIS) & 474L
- or POLS 308 Intergovernmental Relations
- or POLS 432 Public Policy Making Process

Plus electives to total 125 credits.

**Total Credits** 125

---

**B.B.A. with a Major in Aviation Management**

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

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<td>AVIT 221</td>
<td>Basic Attitude Instrument Flying</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 222</td>
<td>IFR Regulations and Procedures</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 250</td>
<td>Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 323</td>
<td>Aerodynamics - Airplanes</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 324</td>
<td>Aircraft Systems</td>
<td>3</td>
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<tr>
<td>AVIT 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 403</td>
<td>Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 485</td>
<td>Aviation Senior Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- AVIT 402 Airport Planning and Administration
- AVIT 405 Airline Operations and Management
- AVIT 407 General Aviation Operations and Management

**Advanced Business Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
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<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
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<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
<td>3</td>
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<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
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<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
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<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
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<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td>3</td>
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<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- GEOG 474 Introduction to Geographic Information Systems (GIS) & 474L
- or POLS 308 Intergovernmental Relations
- or POLS 432 Public Policy Making Process

Plus electives to total 125 credits.

**Total Credits** 125
### John D. Odegard School of Aerospace Sciences

#### B.S. in Aeronautics with a Major in Air Traffic Management

**NOTE:** This program has a selective admission process. See your adviser for information.

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. School of Aerospace Sciences Requirements (see College section).

III. The following curriculum:

#### Essential Studies Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
<td>3</td>
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<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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Fine Arts and Humanities Electives 9

Social Science Electives 9

Math, Science, and Technology Elective 2

#### Aviation Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AVIT 100</td>
<td>Aviation Orientation</td>
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<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
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</tr>
<tr>
<td>or AVIT 142</td>
<td>Introduction to Aviation-Helicopter</td>
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<tr>
<td>&amp; AVIT 143</td>
<td>and Private Pilot-Helicopter Certification</td>
<td>5-6</td>
</tr>
<tr>
<td>AVIT 103</td>
<td>Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 126</td>
<td>Introduction to UAS Operations</td>
<td>2</td>
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<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
<td>3</td>
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<td>AVIT 250</td>
<td>Human Factors</td>
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<td>AVIT 260</td>
<td>Air Traffic Control: Tower Operations I</td>
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<td>AVIT 261</td>
<td>Air Traffic Control: Radar Operations I</td>
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<tr>
<td>AVIT 362</td>
<td>Air Traffic Control: Advanced Tower Operations II</td>
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<td>AVIT 363</td>
<td>Air Traffic Control: Radar Operations II</td>
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<td>AVIT 402</td>
<td>Airport Planning and Administration</td>
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<td>AVIT 465</td>
<td>Air Traffic Control: Radar and Tower Operations IV</td>
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<td>AVIT 468</td>
<td>Air Traffic Control: Non-Radar Procedures</td>
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<td>AVIT 485</td>
<td>Aviation Senior Capstone</td>
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#### Other Requirements

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<th>Course Title</th>
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<tr>
<td>COMM 212</td>
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<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>or AVIT 311</td>
<td>Safety Management System (SMS)</td>
<td></td>
</tr>
<tr>
<td>or AVIT 312</td>
<td>Aircraft Accident Investigation</td>
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Select one of the following:

<table>
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<th>Course Title</th>
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<tr>
<td>ISBC 320</td>
<td>Professional Communication for Business</td>
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<tr>
<td>or ENGL 227</td>
<td>Introduction to Literature and Culture</td>
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<tr>
<td>or ENGL 228</td>
<td>Diversity in Global Literatures</td>
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<tr>
<td>or ENGL 229</td>
<td>Diversity in U.S. Literatures</td>
<td></td>
</tr>
<tr>
<td>or ENGL 308</td>
<td>The Art of Writing Nonfiction</td>
<td></td>
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</table>

Plus electives to total 125 credits.

**Total Credits:** 125

* Students will be required to use their electives to establish expertise in a second field. Normally that will mean completing a specialization, minor, or second major. Suggested fields include Communication, Computer Science, Economics, Foreign Language, Industrial Technology, Atmospheric Sciences, Office Administration, Political Science, Psychology or Public Administration.

* Students will be required to use their electives to establish expertise in a second field, which means completion of a second major, a minor, a specialization, or other degree sub-plans. The Aviation Department may be consulted to discuss other sub-plan options.

#### B.S. in Aeronautics with a Major in Aviation Technology Management

Admission to this program requires the successful completion of an approved aviation technical program, with certification. Examples of approved technical certifications include: FAA Mechanic Certificate with Airframe and Powerplant ratings; FCC General Class Radio and Telephone License; FAA Aircraft Dispatcher License; FAA Commercial Pilot License; FAA Certified Tower Operator License or Radar Rating, or equivalent levels of certification in other related technical programs.

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. School of Aerospace Sciences Requirements (see College section).

III. The following curriculum:

#### Essential Studies Courses

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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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Fine Arts and Humanities Electives 9

Social Science Electives 9

Math, Science, and Technology Elective 2

#### Aviation Courses

<table>
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<tr>
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<tbody>
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<td>AVIT 100</td>
<td>Aviation Orientation</td>
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<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>1</td>
</tr>
<tr>
<td>or AVIT 142</td>
<td>Introduction to Aviation-Helicopter</td>
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<td>and Private Pilot-Helicopter Certification</td>
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<td>AVIT 103</td>
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<td>AVIT 126</td>
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<td>Human Factors</td>
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</tr>
<tr>
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<tr>
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<td>Air Traffic Control: Advanced Tower Operations II</td>
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<td>AVIT 363</td>
<td>Air Traffic Control: Radar Operations II</td>
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</tr>
<tr>
<td>AVIT 402</td>
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<td>AVIT 403</td>
<td>Aerospace Law</td>
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</tr>
<tr>
<td>AVIT 464</td>
<td>Air Traffic Control: Tower and Radar Operations III</td>
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</tr>
<tr>
<td>AVIT 465</td>
<td>Air Traffic Control: Radar and Tower Operations IV</td>
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</tr>
<tr>
<td>AVIT 468</td>
<td>Air Traffic Control: Non-Radar Procedures</td>
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</tr>
<tr>
<td>AVIT 485</td>
<td>Aviation Senior Capstone</td>
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#### Other Requirements

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<th>Course Title</th>
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<td>COMM 212</td>
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</tr>
<tr>
<td>or AVIT 311</td>
<td>Safety Management System (SMS)</td>
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</tr>
<tr>
<td>or AVIT 312</td>
<td>Aircraft Accident Investigation</td>
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Select two of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AVIT 402</td>
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<tr>
<td>AVIT 405</td>
<td>Airline Operations and Management</td>
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</tr>
<tr>
<td>AVIT 407</td>
<td>General Aviation Operations and Management</td>
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**OTHER REQUIREMENTS**

Select 30 credits from the following:

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<th>Course Title</th>
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<tr>
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<td>AVIT 311</td>
<td>Safety Management System (SMS)</td>
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<td>AVIT 312</td>
<td>Aircraft Accident Investigation</td>
<td></td>
</tr>
<tr>
<td>AVIT 313</td>
<td>Aviation Insurance</td>
<td></td>
</tr>
<tr>
<td>AVIT 337</td>
<td>Survey of Unmanned Aircraft Systems</td>
<td></td>
</tr>
<tr>
<td>AVIT 408</td>
<td>Fleet Planning and Aircraft Acquisition</td>
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<tr>
<td>AVIT 412</td>
<td>Aviation Safety Analysis</td>
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</tr>
<tr>
<td>ISBC 320</td>
<td>Professional Communication for Business</td>
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<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>30</td>
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</tbody>
</table>

* Students will be required to use their electives to establish expertise in a second field. Normally that will mean completing a specialization, minor, or second major. Suggested fields include Communication, Computer Science, Economics, Foreign Language, Industrial Technology, Atmospheric Sciences, Office Administration, Political Science, Psychology or Public Administration.

* Students will be required to use their electives to establish expertise in a second field, which means completion of a second major, a minor, a specialization, or other degree sub-plans. The Aviation Department may be consulted to discuss other sub-plan options.
### III. The following curriculum:

#### I. Essential Studies Requirements (see University ES listing).

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

- **Aviation Courses**
  - AVIT 100  Aviation Orientation 1
  - AVIT 103  Introduction to Air Traffic Control 2
  - AVIT 208  Aviation Safety 3
  - AVIT 250  Human Factors 2
  - AVIT 309  Flight Physiology 3
  - AVIT 327  Gas Turbine Engines 2
  - AVIT 403  Aerospace Law 3
  - AVIT 411  International and Long Range Navigation 3
  - AVIT 430  Crew Resource Management 3
  - AVIT 485  Aviation Senior Capstone 3
  - Select two of the following: 6
    - AVIT 402  Airport Planning and Administration
    - AVIT 405  Airline Operations and Management
    - AVIT 407  General Aviation Operations and Management

#### II. School of Aerospace Sciences Requirements (see College section).

#### III. The following curriculum:

#### Essential Studies Courses

- ATSC 110  Meteorology I 3
- ATSC 110L  Meteorology I Laboratory 1
- COMM 110  Fundamentals of Public Speaking 3
- ENGL 110  College Composition I 3
- ENGL 130  Composition II: Writing for Public Audiences 3
- Fine Arts and Humanities Electives 9
- MATH 103  College Algebra (Or any higher level math class.) 3
- Social Science Electives 9
- Math, Science, and Technology Elective 2

#### Aviation Core Courses

- AVIT 102  Introduction to Aviation 5
- AVIT 221  Basic Attitude Instrument Flying 3
- AVIT 222  IFR Regulations and Procedures 3
- AVIT 323  Aerodynamics - Airplanes 3
- AVIT 324  Aircraft Systems 3
- AVIT 325  Multi-Engine Systems and Procedures 2
- AVIT 414  Certified Flight Instructor Certification 5
- AVIT 415  Instrument Flight Instructor 4
- AVIT 421  Advanced Aerodynamics 3
- AVIT 428  Transport Category Aircraft Systems 4

#### Other Requirements

- ATSC 231  Aviation Meteorology 4
- Select one of the following: 3
  - ENGL 227  Introduction to Literature and Culture 3
  - or ENGL 228  Diversity in Global Literatures 3
  - or ENGL 229  Diversity in U.S. Literatures 3
  - or ENGL 308  The Art of Writing Nonfiction 3
  - or ISBC 320  Professional Communication for Business 3

#### Required Courses - Airplane Option

- AVIT 102  Introduction to Aviation 5
- AVIT 221  Basic Attitude Instrument Flying 3
- AVIT 222  IFR Regulations and Procedures 3
- AVIT 323  Aerodynamics - Airplanes 3
- AVIT 324  Aircraft Systems 3
- AVIT 325  Multi-Engine Systems and Procedures 2
- AVIT 414  Certified Flight Instructor Certification 5
- AVIT 415  Instrument Flight Instructor 4
- AVIT 421  Advanced Aerodynamics 3
- AVIT 428  Transport Category Aircraft Systems 4

#### Required Courses - Helicopter Option

- AVIT 142  Introduction to Aviation-Helicopter 5
- AVIT 143  Private Pilot-Helicopter Certification 1
- AVIT 241  Commercial Helicopter 4
- AVIT 242  Introduction to Commercial Flying-Helicopter 1
- AVIT 247  R44 Helicopter Transition 1
- AVIT 310  Public Safety Aviation 3
- AVIT 342  IFR Regulations and Procedures-Helicopter 3
- AVIT 343  Instrument Rating-Helicopter Certification 1
- AVIT 444  Helicopter Advanced Operations 4
- AVIT 445  Commercial Pilot-Helicopter Certification 1
- One of the Following Courses for the Helicopter Option (1-5 Credits)
  - AVIT 311  Safety Management System (SMS) 3
  - AVIT 414  Certified Flight Instructor Certification 5
  - AVIT 415  Instrument Flight Instructor 4

Plus electives to total 125 credits.

### B.S. in Aeronautics with a Major in Commercial Aviation

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

- **Aviation Courses**
  - AVIT 100  Aviation Orientation 1
  - AVIT 103  Introduction to Air Traffic Control 2
  - AVIT 208  Aviation Safety 3
  - AVIT 250  Human Factors 2
  - AVIT 309  Flight Physiology 3
  - AVIT 327  Gas Turbine Engines 2
  - AVIT 403  Aerospace Law 3
  - AVIT 411  International and Long Range Navigation 3
  - AVIT 430  Crew Resource Management 3
  - AVIT 485  Aviation Senior Capstone 3
  - Select two of the following: 6
    - AVIT 402  Airport Planning and Administration
    - AVIT 405  Airline Operations and Management
    - AVIT 407  General Aviation Operations and Management

#### Other Requirements

- ATSC 231  Aviation Meteorology 4
- Select one of the following: 3
  - ENGL 227  Introduction to Literature and Culture 3
  - or ENGL 228  Diversity in Global Literatures 3
  - or ENGL 229  Diversity in U.S. Literatures 3
  - or ENGL 308  The Art of Writing Nonfiction 3
  - or ISBC 320  Professional Communication for Business 3

#### Required Courses - Airplane Option

- AVIT 102  Introduction to Aviation 5
- AVIT 221  Basic Attitude Instrument Flying 3
- AVIT 222  IFR Regulations and Procedures 3
- AVIT 323  Aerodynamics - Airplanes 3
- AVIT 324  Aircraft Systems 3
- AVIT 325  Multi-Engine Systems and Procedures 2
- AVIT 414  Certified Flight Instructor Certification 5
- AVIT 415  Instrument Flight Instructor 4
- AVIT 421  Advanced Aerodynamics 3
- AVIT 428  Transport Category Aircraft Systems 4

#### Required Courses - Helicopter Option

- AVIT 142  Introduction to Aviation-Helicopter 5
- AVIT 143  Private Pilot-Helicopter Certification 1
- AVIT 241  Commercial Helicopter 4
- AVIT 242  Introduction to Commercial Flying-Helicopter 1
- AVIT 247  R44 Helicopter Transition 1
- AVIT 310  Public Safety Aviation 3
- AVIT 342  IFR Regulations and Procedures-Helicopter 3
- AVIT 343  Instrument Rating-Helicopter Certification 1
- AVIT 444  Helicopter Advanced Operations 4
- AVIT 445  Commercial Pilot-Helicopter Certification 1
- One of the Following Courses for the Helicopter Option (1-5 Credits)
  - AVIT 311  Safety Management System (SMS) 3
  - AVIT 414  Certified Flight Instructor Certification 5
  - AVIT 415  Instrument Flight Instructor 4

Plus electives to total 125 credits.
B.S. in Aeronautics with a Major in Unmanned Aircraft Systems Operations

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. School of Aerospace Sciences Requirements (see College section).

III. The following curriculum:

**Essential Studies Courses**

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<td>Meteorology I</td>
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<td>1</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 130</td>
<td>Introduction to Scientific Programming</td>
<td>4</td>
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<tr>
<td>OR</td>
<td></td>
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<tr>
<td>CSCI 160</td>
<td>Computer Science I</td>
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<td>CSCI 290</td>
<td>Cyber-Security and Information Assurance</td>
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<td>ENGL 110</td>
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<td>3</td>
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<td>Fine Arts and Humanities Electives</td>
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**Aviation Courses**

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<td>2</td>
</tr>
<tr>
<td>AVIT 126</td>
<td>Introduction to UAS Operations</td>
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<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
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<td>AVIT 221</td>
<td>Basic Attitude Instrument Flying</td>
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<tr>
<td>AVIT 222</td>
<td>IFR Regulations and Procedures</td>
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<tr>
<td>AVIT 238</td>
<td>UAS Operator Certification</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 250</td>
<td>Human Factors</td>
<td>2</td>
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<tr>
<td>AVIT 323</td>
<td>Aerodynamics - Airplanes</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 324</td>
<td>Aircraft Systems</td>
<td>3</td>
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<tr>
<td>AVIT 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>2</td>
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<tr>
<td>AVIT 327</td>
<td>Gas Turbine Engines</td>
<td>2</td>
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<tr>
<td>AVIT 331</td>
<td>UAS Flight Systems</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 332</td>
<td>UAS Ground Systems</td>
<td>3</td>
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<tr>
<td>AVIT 333</td>
<td>UAS Remote Sensing</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 403</td>
<td>Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 430</td>
<td>Crew Resource Management</td>
<td>3</td>
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<tr>
<td>AVIT 438</td>
<td>UAS Operations</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 485</td>
<td>Aviation Senior Capstone</td>
<td>3</td>
</tr>
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</table>

**Other Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 231</td>
<td>Aviation Meteorology</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 227</td>
<td>Introduction to Literature and Culture</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 228</td>
<td>Diversity in Global Literatures</td>
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<tr>
<td>or ENGL 229</td>
<td>Diversity in U.S. Literatures</td>
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<tr>
<td>or ENGL 308</td>
<td>The Art of Writing Nonfiction</td>
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<tr>
<td>or ISBC 320</td>
<td>Professional Communication for Business</td>
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Plus electives to total 125 credits.

Total Credits 125

**Minors in Aviation**

**NOTE:** Students majoring in any of the seven aviation majors listed above are not eligible to declare either of these minors.

**Minor in Professional Flight**

Required: 30 credits including:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ATSC 231</td>
<td>Aviation Meteorology</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 221</td>
<td>Basic Attitude Instrument Flying</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 222</td>
<td>IFR Regulations and Procedures</td>
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<td>3</td>
</tr>
<tr>
<td>AVIT 324</td>
<td>Aircraft Systems</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 325</td>
<td>Multi-Engine Systems and Procedures</td>
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</tbody>
</table>

Total Credits 30

**Minor in Aviation Management**

Required: 21 credits including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>AVIT 101</td>
<td>Survey of Flight</td>
<td>5</td>
</tr>
<tr>
<td>or AVIT 102</td>
<td>Introduction to Aviation</td>
<td></td>
</tr>
<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 402</td>
<td>Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 403</td>
<td>Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>or AVIT 405</td>
<td>Airline Operations and Management</td>
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</tbody>
</table>

Total Credits 21

**Optional Specializations**

Student coursework toward the Bachelor of Business Administration or Bachelor of Science described above may be augmented with one or more of the following specializations. Each specialization completed will be noted on the student's academic transcript.

**Business Aviation Specialization**

Required Courses (16 credits including):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 311</td>
<td>Safety Management System (SMS)</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 313</td>
<td>Aviation Insurance</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 407</td>
<td>General Aviation Operations and Management</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 408</td>
<td>Fleet Planning and Aircraft Acquisition</td>
<td>4</td>
</tr>
<tr>
<td>ENTR 386</td>
<td>Entrepreneurship: The Numbers</td>
<td>3</td>
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</tbody>
</table>

Total Credits 16

**Safety Specialization**

Required Courses (17 credits including):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 311</td>
<td>Safety Management System (SMS)</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 412</td>
<td>Aviation Safety Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>
CSCI 290  Cyber-Security and Information Assurance  3
OSEH 395  Hazardous Materials Management  3
OSEH 435  Risk Management  2
TECH 440  Occupational Safety  3

Total Credits  17

**Optional Courses (available with department approval)**

AVIT 312  Aircraft Accident Investigation  3
AVIT 313  Aviation Insurance  3

All 300 and 400 level courses are restricted to Aviation majors, minors, or to students with instructor/departmental permission. All 400 level courses are restricted to junior/senior status.

**Courses**

**AVIT 100. Aviation Orientation. 1 Credit.**
This course is required for all aviation majors. Its purpose is to prepare new students for their university and professional careers by discussing students’ responsibilities and options concerning the aviation industry. Aviation career options will be explored. Academic and airport requirements and procedures will be covered. F.S.

**AVIT 102. Introduction to Aviation. 5 Credits.**
The course will develop the student’s knowledge and skills that are needed to safely exercise the privileges and responsibilities of a Private Pilot. Course content includes instruction in aerodynamics, aircraft systems, FAA regulations, U.S. Airspace System, weight and balance, aircraft performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites or Corequisites: ATSC 110 and a minimum GPA of 2.5. F,S,SS.

**AVIT 103. Introduction to Air Traffic Control. 2 Credits.**
This course allows all aviation majors the opportunity to simulate the role of an air traffic controller in a terminal radar approach control (TRACON) environment. Students will work in a north/south sectorization facility that has departures and arrivals landing at civilian controlled/uncontrolled airports and military airports. This realistic look at air traffic control (ATC) will enhance any aviation enthusiast’s dream of working the radar scope. F,S,SS.

**AVIT 126. Introduction to UAS Operations. 2 Credits.**
This course of instruction introduces the student to the history of Unmanned Aircraft Systems and their current and future development for use in a burgeoning civil industry. Specific blocks deal with aircraft, ground, communications, launch and recovery systems while emphasizing the human integration into the overall system. F.S.

**AVIT 142. Introduction to Aviation-Helicopter. 5 Credits.**
This course develops the knowledge needed to safely exercise the privileges and responsibilities of a Private Pilot. Course content includes instruction in helicopter aerodynamics, helicopter systems, FAA regulations, U.S. airspace system, weight and balance, helicopter performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. Corequisite: AVIT 143. Prerequisite or Corequisite: ATSC 110 and ATSC 110L. F.S.

**AVIT 143. Private Pilot-Helicopter Certification. 1 Credit.**
This course provides the training required to obtain a Private Pilot Certificate with Rotorcraft-Helicopter category and class ratings. The student will learn the fundamentals of helicopter flying, including aerodynamics, aeronautical decision making, emergency procedures and class cockpit operations. Prerequisite or Corequisite: AVIT 142. S/U grading. F,S,SS.

**AVIT 208. Aviation Safety. 3 Credits.**
This course provides the student with a detailed introduction into aspects of aviation safety, aviation safety programs, risk management, and the associated components of pilot psychology, physiology, human factors, and accident review and investigation. Prerequisites: A minimum GPA of 2.5 and AVIT 102 or AVIT 142. F,S,SS.

**AVIT 221. Basic Attitude Instrument Flying. 3 Credits.**
This course begins with a discussion of Aeronautical Decision Making (ADM), Airworthiness Requirements for flight, Human Factors and night flight. The course proceeds to an in-depth study of pilot/static and gyro instruments and Basic Attitude Instrument Flying. In addition, there will be a discussion of the operation, interpretation, and practical use of VOR, ADF, DME, GPS, RMI, and HSI, as well as an introduction to Electronic Instrument Flight Displays (Glass Cockpit Dekos). The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisite: AVIT 102 and a minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 100. F,S,SS.

**AVIT 222. IFR Regulations and Procedures. 3 Credits.**
This course will provide the student with a detailed study of the regulations, procedures, and publications necessary for operating IFR in the national airspace system. Terminal and enroute procedures will be studied in detail. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 208, AVIT 221, and a minimum GPA of 2.5. F,S,SS.

**AVIT 238. UAS Operator Certification. 3 Credits.**
This course will develop the student’s knowledge and skills needed to manage and operate small unmanned aircraft systems. Course content includes Federal Aviation Regulations, airspace authorization criteria, and operational approval requirements. Mission employment skills will be acquired through both classroom and hands-on flight activities. Flight activities will include launch and recovery operations, emergency procedures, mission planning and execution. Students must complete the appropriate UAS flight lessons to satisfactorily complete the course. Prerequisites: AVIT 126 and AVIT 102 or AVIT 142. F,S,SS.

**AVIT 241. Commercial Helicopter. 4 Credits.**
This course provides a study of commercial helicopter systems, including turbine engines, drive trains, fuel, hydraulic, electrical, and basic flight instruments. Navigation aids, commercial regulations, and adverse helicopter aerodynamics will also be studied. Prerequisites: AVIT 142 and a minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 100. S.

**AVIT 242. Introduction to Commercial Flying-Helicopter. 1 Credit.**
This course is the beginning of a student’s commercial helicopter flight training and is structured to improve and refine aeronautical decision making skills and aircraft control technique. The night flying experience requirements for a FAA Commercial Pilot certificate with Rotorcraft-Helicopter category and class ratings will also be obtained. Prerequisites: AVIT 142 and AVIT 143; minimum GPA of 2.5. S/U grading. F,S,SS.

**AVIT 247. R44 Helicopter Transition. 1 Credit.**
This course provides the training necessary to operate a Robinson R44 helicopter as pilot-in-command, including flight experience in the R44 helicopter. Prerequisite: Minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 241. S/U grading. On demand.

**AVIT 250. Human Factors. 2 Credits.**
This course introduces the student to issues influencing human performance in the complex operational aviation environments. Theory and practical applications of cognitive processing, decision-making, interpersonal interaction and communication will be presented. This course also provides an introduction to design elements intended to optimize man-machine interaction. Prerequisite: Minimum GPA of 2.5. F,S,SS.

**AVIT 260. Air Traffic Control: Tower Operations I. 4 Credits.**
Provides an orientation to basic fundamental clearance deliver (CD) and ground control (GC) operations and procedures. Tower interaction with other ATC and non-ATC agencies is also part of this course. To complete this course, students must demonstrate their basic knowledge of the CD/GC function of control tower operations through written and performance examinations. An ATC lab is required. Prerequisites: AVIT 100, AVIT 103, and a minimum GPA of 2.5. F,S,SS.

**AVIT 261. Air Traffic Control: Radar Operations I. 4 Credits.**
This course provides students with basic radar training and knowledge of separation requirements and procedures of terminal radar operations. Student evaluations are based on demonstrated application of acquired controller skills utilizing ATC simulation. Scenarios progress in difficulty. To complete this course, students must, in addition to normal academic requirements, successfully complete an intermediate radar simulation scenario without assistance. An ATC lab is required. Prerequisites: AVIT 100, AVIT 103, and a minimum GPA of 2.5. F,S,SS.
AVIT 309. Flight Physiology. 3 Credits.
In this course, human physiological responses to the stresses of flight environment will be examined in-depth. Topics include decompression, hypoxia, spatial disorientation, altered pressure environments, acceleration and fatigue. The students will experience altered pressure environments during laboratory flights in the UND Aerospace altitude chamber. Prerequisites: AVIT 250; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 310. Public Safety Aviation. 3 Credits.
This course develops the student's knowledge related to the organization, operations, tactics and techniques related to air support operations within law enforcement, fire protection and resource protection agencies. Specific topics include: Airborne law enforcement patrol, surveillance and special operations (SWAT); fire operations including fire chemistry and behavior, fire department organization and tactics, airborne firefighting equipment, fire extinguishment tactics and air ambulance operations; and, resource protection air operations including wildlife surveys, hunting and fishing enforcement patrols, search and rescue and operations from unimproved landing sites and seaplane operations. Prerequisite: AVIT 102 or AVIT 142 or consent of instructor; minimum GPA of 2.5. S.

AVIT 311. Safety Management System (SMS). 3 Credits.
This course provides instruction and practical application of Safety Management Systems (SMS) and how SMS relates to Accident Prevention Program Management. Students receive the necessary instruction required to design, develop, implement, manage, and foster an effective organizational level SMS and accident prevention program. Course topics include theory and application of SMS program elements. Prerequisites: AVIT 208 and a minimum GPA of 2.5. S.

AVIT 312. Aircraft Accident Investigation. 3 Credits.
This course is a detailed evaluation of the methods and procedures involved in aircraft accident investigation including the organization, duties, and procedures of the Aircraft Accident Board. Prerequisites: AVIT 208, AVIT 250, and a minimum GPA of 2.5. S.

AVIT 313. Aviation Insurance. 3 Credits.
This course is an introduction to the basic principles of insurance and risk applicable to general aviation aircraft owners, fixed base operators, and airport management personnel. It includes an in-depth review of the aviation insurance industry in the United States, including market analysis and types of aviation insurers. Prerequisite: Minimum GPA of 2.5. F.

AVIT 320. Airline Career Planning. 2 Credits.
This course introduces the student to operations and quality of life issues related to working in a large flight department or air carrier environment. The material is not limited to one specific area of a professional pilot's career, but will seek to cover far reaching issues and provide the student with a wide perspective of what to expect as an airline pilot. Specific topics include: airline style interviews, training formats, working agreements, collective bargaining, bidding, scheduling, seniority, travel benefits, personal finance and other similar quality of life issues that will be encountered as a professional pilot. This course introduces the student to specific regulations pertaining to airline pilots, such as duty, rest and flight time restrictions. Prerequisites: AVIT 222 and a minimum GPA of 2.5. F.

AVIT 323. Aerodynamics - Airplanes. 3 Credits.
This course will provide the student a study of the physical principles of airplane aerodynamics, thereby fostering an appreciation of the factors affecting aircraft performance, stability and control, and special flight conditions often experienced by commercial pilots of fixed-wing aircraft. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisite: AVIT 222; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 324. Aircraft Systems. 3 Credits.
This course provides an in-depth study of reciprocating engine, propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems. Prerequisite: Open to Aviation majors and minors only; minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 221. F,S,SS.

AVIT 325. Multi-Engine Systems and Procedures. 2 Credits.
This course is designed to develop the knowledge and skills necessary to safely and proficiently exercise the privileges and responsibilities of a Commercial Pilot with a Multi-engine rating. Included are discussions concerning Aeronautical Decision Making of multi-engine aircraft systems, aerodynamics, Crew Resource Management, weight and balance, aircraft performance, and abnormal/emergency procedures. The course also includes a scenario based introduction to U.S. Title 14 Code of Federal Regulations (CFR) governing common carriage commercial operations. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 323 and AVIT 324; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 327. Gas Turbine Engines. 2 Credits.
This course will provide an in-depth introduction to the turbine engine through the study of its development, theory of operation and the function of turbine engine components. Prerequisites: AVIT 142 or AVIT 324; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 331. UAS Flight Systems. 3 Credits.
This course of instruction introduces the student to the systems common to most Unmanned Aircraft with focus on those that differ significantly from their manned counterparts. Specific emphasis is placed upon autopilot systems and their integration with flight controls and airborne communications systems. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.5. Corequisite: AVIT 332. F,S.

AVIT 332. UAS Ground Systems. 3 Credits.
This course introduces the student to those subsystems that comprise the unmanned aircraft system (UAS) ground control and mission planning system. The launch and recovery systems typical of current UAS are also covered. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.5. Corequisite: AVIT 331. F,S.

AVIT 333. UAS Remote Sensing. 4 Credits.
This course presents the theory and operations of common sensors used by the operators of unmanned aircraft systems. Theory is combined with operational scenarios in order to provide the student with the ability to match specific sensors with anticipated missions. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.5. F,S.

AVIT 337. Survey of Unmanned Aircraft Systems. 2 Credits.
This course is designed for non-UAS majors to provide an introduction to Unmanned Aircraft Systems (UAS). Course content includes aircraft operating software, launch and recovery operations, payload operations, normal and emergency procedures, and mission planning and execution. It also includes a flight simulation component to provide exposure to the duties and responsibilities of UAS flight crew members but does not provide proficiency or certification on a specific UAS platform. Prerequisites: AVIT 102 and a minimum GPA of 2.5. F,S,SS.

AVIT 342. IFR Regulations and Procedures-Helicopter. 3 Credits.
This course provides a detailed study of the regulations, procedures, and publications necessary to operate a helicopter IFR in the national airspace system. Basic Attitude Instrument flying will be introduced and will include the interpretation and practical use of instrument navigation systems. Prerequisite: AVIT 241 and a minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 242. F,S.

AVIT 343. Instrument Rating-Helicopter Certification. 1 Credit.
This course provides the training required to obtain an Instrument-Helicopter rating and to safely operate a helicopter as pilot-in-command under IFR in the national airspace system. It includes basic instrument flying, radio navigation, and glass cockpit procedures. Prerequisite: AVIT 242 and a minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 342. S/U grading. F,S,SS.

AVIT 362. Air Traffic Control:Advanced Tower Operations II. 4 Credits.
Utilizing the 3D tower simulator, the students are taught the basic, advanced, and fundamental local control tower operations, structure, procedures, tower concepts, theories, positions, and facility levels (5-7). Students will build on the knowledge gained in AVIT 260 ATC Tower Operations I. Students will be required to demonstrate the basic knowledge by applying radar arrivals/departure procedures. To complete this course, students will be required to demonstrate their basic knowledge of control tower operations through written examinations and performance scenarios in an ATC lab. Prerequisites: AVIT 260 and a minimum GPA of 2.5. F,S,SS.
AVIT 363. Air Traffic Control/Radar Operations II. 4 Credits.
This course provides students with advanced radar training and knowledge of separation requirements and procedures of terminal radar operations. Using advanced Air Traffic Control techniques, uncontrolled airport, military, and emergency operations are introduced. Student evaluations are based on demonstrated application of acquired controller skills utilizing ATC simulation. Scenarios progress in difficulty. To complete this course, students must, in addition to normal academic requirements, successfully complete required advanced radar simulation scenarios without assistance. An ATC lab is required. Prerequisites: AVIT 101 or AVIT 102, and AVIT 261; minimum GPA of 2.5. F,S,SS.

AVIT 372. Global Perspectives in Aviation History. 3 Credits.
This course investigates aviation's effects on global culture, commerce, and politics throughout its history by examining original historical sources and evidence from significant events in aviation. After taking this class, students will be more aware of their own and other cultural frameworks and biases and be able to use that perspective effectively as aviation professionals in a global industry. Prerequisite: Minimum GPA of 2.5. On demand.

AVIT 386. Conventional Aircraft Operations. 1 Credit.
Provides the necessary ground school and dual flight instruction for an endorsement for operation of tailwheel-type airplanes. Allows the student to acquire the knowledge and skills necessary for operation of the tailwheel aircraft on the ground and in flight. Prerequisites: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.5. S/U grading. F,SS.

AVIT 389. Introduction to Aerobatic Flight. 1 Credit.
To introduce, analyze and fly some of the more advanced flight maneuvers defined as aerobatics. Basic aerobatic maneuvers will be flown during the course including loops, spins, rolls, and inverted flight, with advanced variations and combinations of maneuvers demonstrated in flight. Prerequisite: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.5. S/U grading. F,SS.

AVIT 397. Cooperative Education. 1-2 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement between student, aviation department, and employer. A maximum of four cooperative education credits may be applied toward the total credits needed to complete degree requirements. Co-op credits may not be substituted for any required course within the student's major. Prerequisites: Acceptance into a co-op position with cooperating industry and approval of the aviation department; open to aviation majors and minors only. Repeatable to 4 credits. S/U grading. F,SS.

AVIT 399. Special Aerospace Topics. 1-12 Credits.
Prerequisites: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.5. Repeatable to 12 credits. S/U grading. F,S.

AVIT 402. Airport Planning and Administration. 3 Credits.
This is the first of a two course curriculum in airport administration. This initial course provides an introduction to the complex elements of airport planning and its importance in achieving a successful airport operation. Course content includes a study of the duties and responsibilities of the airport manager with a special emphasis on the Federal Air Regulations governing the operation and administration of commercial service airports within the United States. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.5. F,S,SS.

AVIT 403. Aerospace Law. 3 Credits.
This course is designed to introduce the student to the United States legal system and the development of air law. The course will cover a broad range of topics related to aviation operations including constitutional law, administrative law, Federal Aviation Administration enforcement actions, aircraft ownership issues, products liability law, criminal law, contract law, and international law. Course activities include case reading, argument, and legal research. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.5. F,S,SS.

AVIT 405. Airline Operations and Management. 3 Credits.
This course examines the four major areas of air carrier operations, including ground, technical, flight and system operations, as well as airline economics, utilizing a management simulation tool. There is an intensive examination of regional, point-to-point and network carrier operations. Student management teams make weekly decisions in seven categories: Overall Strategy; Marketing; Operations Management; Human Resource Development; Finance; Asset Management; and Behavioral Elements. A portion of each class time is devoted to simulation activities, and the reading assignments focus on management decisions pertinent to the topic assigned, relying in part on current industry events, with an emphasis on ethical decision making. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.5. F,S,SS.

AVIT 407. General Aviation Operations and Management. 3 Credits.
Aspects of the operation and management of corporate flight departments, fixed-base operations, air cargo operations, and fractional ownership programs will be discussed. Pertinent regulations including FAR parts 91 and 135 will be studied. Aircraft and equipment evaluations will be conducted. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.5. F,S,SS.

AVIT 408. Fleet Planning and Aircraft Acquisition. 4 Credits.
This course will analyze the needs and missions of various business flight departments, provide insight into aircraft selection, and explore the details of aircraft acquisition. A broad range of issues will be discussed, including finance options, insurance coverage, and fleet management. Prerequisites: AVIT 102 or AVIT 142, AVIT 407, and a minimum GPA of 2.5. F.

AVIT 411. International and Long Range Navigation. 3 Credits.
This course provides an understanding of global charting systems, great circle routes and waypoint plotting. Problems and methods of international flight and modern systems of long range navigation are studied as well as methods and systems of computing, communicating and displaying navigation information. This course also gives the student a familiarization with the international airspace structure including Required Navigation Performance (RNP) standards, Minimum Navigation Performance Specification (MNPS) operations and Reduced Vertical Separation Standards (RVSM). Prerequisites: AVIT 241 or AVIT 325; open to aviation majors and minors only; minimum GPA of 2.5. F.

AVIT 412. Aviation Safety Analysis. 3 Credits.
This course will examine the various techniques and processes used to assess and predict organizational risk as it pertains to aviation operations. The role of quality assurance within a Safety Management System (SMS) will be also explored. An introduction to specific aviation safety assurance programs will be conducted and will include safety surveys and formalized observations. Prerequisites: AVIT 311 and a minimum GPA of 2.5. S.

AVIT 414. Certified Flight Instructor Certification. 5 Credits.
Provides the student with a detailed study of the responsibilities and teaching concerns of a flight instructor. The course is divided into two major sections: fundamentals of teaching and learning, including effective teaching methods, learning process, consideration of flight training syllabi, effective evaluations, and flight instructor responsibilities; the second section is concerned with the analysis of the flight maneuvers involved with Private Pilot, Commercial Pilot and Flight Instructor Certificates. The course will also provide practical teaching experiences. The student must complete the associated flight lessons in the CFI Flight Course to satisfactorily complete the course. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 415. Instrument Flight Instructor. 4 Credits.
Provides the student with an in-depth study of the responsibilities and techniques to be used as an Instrument Flight Instructor. This course will also include additional study of instrument flight, charts, publications and regulations pertaining to the IFR environment, further develop the student's knowledge of Technically Advanced Aircraft and provide practical teaching experience. The student must complete the associated flight lessons in the Instrument Flight Instructor course to satisfactorily complete the course. Prerequisites: AVIT 414 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.
AVIT 416. Multi-Engine Flight Instructor. 2 Credits.
This course provides an understanding of the fundamentals of teaching in a multi-engine airplane. The course will include multi-engine aerodynamics and performance, analysis of multiengine operations, single-engine operations and procedures, flight instructor responsibilities, flight safety concerns and instrument flight maneuvers in multi-engine airplanes. The student must complete the associated flight lessons in the Multi-engine Airplane CFI course to satisfactorily complete the course. Prerequisites: AVIT 415 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 421. Advanced Aerodynamics. 3 Credits.
Beginning with a brief review of low speed aerodynamics, the course provides a study of the terminology and aerodynamics fundamentals associated with transonic and supersonic flight. Prerequisites: AVIT 325 and Junior or Senior status or consent of the instructor; open to aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 428. Transport Category Aircraft Systems. 4 Credits.
This course provides an in-depth study of the complex systems of today's air transport jet aircraft with an emphasis on the Canadair Regional Jet aircraft. It provides a review of all primary systems, to include both normal and abnormal operations. The course also provides the necessary background for Regional Jet simulator training to be presented in a later course. A course fee is charged for access to the Canadair Regional Jet virtual flight deck. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 429. Turboprop Operations. 4 Credits.
This course will provide an introduction to turboprop aircraft systems and procedures. Emphasis will be placed on the systems and operational procedures for a specific model of turboprop aircraft utilized by regional airlines. Course content and presentation will be similar to air carrier initial training. The course will provide a synopsis of the turboprop industry including any recent developments. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 430. Crew Resource Management. 3 Credits.
This course will provide an in-depth study of Crew Resource Management which involves having a thorough understanding of crew communications, teamwork, leadership, "followership," decision-making, and situational awareness. In addition, the student will learn how to properly utilize all available resources in order to conduct a safe and efficient flight. This course will also examine the benefits of diversity, and the role diversity plays in the modern aerospace industry. Prerequisites: AVIT 250 and either AVIT 342 or AVIT 325; Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 438. UAS Operations. 4 Credits.
This course of instruction will develop the student's knowledge and skills that are needed to safely employ unmanned aircraft systems. Course content includes aircraft operating software, launch and recovery operations, payload operations, normal and emergency procedures, and mission planning and execution. Specific emphasis will be placed upon aircraft and payload selection based upon proposed mission analysis. Students must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 126, AVIT 325, AVIT 331, AVIT 332, and a minimum GPA of 2.5. F,S,SS.

AVIT 442. Airport Operations and Administration. 3 Credits.
This course is the second of a two course curriculum in airport administration. It is an advanced course emphasizing the further development of the skills and understanding of the operation and management of commercial service airports of all sizes. The content focuses upon the practical application of airport manager skills and includes educational tours of operating airports. The program stresses the airport manager's role in relations with tenants, public officials, and patrons through the honing of individual writing and public speaking skills. Prerequisites: AVIT 402 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.5. S.

AVIT 444. Helicopter Advanced Operations. 4 Credits.
This course provides advanced study of helicopter aerodynamics and performance as applied to commercial helicopter operations in varying extreme environmental field conditions, including mountain, off-shore (salt water), desert, arctic and tropical operations. Specific helicopter missions are studied, including agriculture, long-line, off-shore and night vision goggle operations. Prerequisite: AVIT 241 and AVIT 242; minimum GPA of 2.5. F.

AVIT 445. Commercial Pilot-Helicopter Certification. 1 Credit.
This course is a continuation of commercial helicopter flight training and is completed after the student has obtained the Instrument-Helicopter rating. This course further refines the aeronautical decision making and flight proficiency skills necessary to obtain the Commercial Pilot-Rotorcraft-Helicopter rating. Prerequisite: AVIT 343 and a minimum GPA of 2.5. S/U grading. F,S,SS.

AVIT 464. Air Traffic Control: Tower and Radar Operations III. 4 Credits.
This course teaches advanced tower and radar operations and procedures. Students will learn about and practice military overhead maneuvers, arrivals and departures from uncontrolled airports, below Basic VFR minima operations, IFR operations, nighttime operations, in-flight and ground emergencies, bomb threat procedures, and special operations (runway incursions, hot cargo, hijacking) procedures. To complete this course, students must demonstrate their knowledge of the preceding tower courses, in addition to this course's content. An ATC lab is required. Prerequisites: AVIT 362, AVIT 363, and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 465. Air Traffic Control: Radar and Tower Operations IV. 4 Credits.
This is the capstone course for the ATC program focusing on the interaction between the Tower, Terminal Radar, and En-Route Facilities. The course provides students with highly advanced instruction on the ATC system, publications, Federal Aviation Regulations, separation standards, airspace utility, aircraft types and characteristics, fundamentals of navigation, pilot's environment, flight assistance and emergencies, special operations, wake turbulence, weather, communications, and teamwork. Instruction is delivered through classroom lecture, group discussions and scenarios with hands-on practice. To complete this course, students must successfully complete the FAA AT Basic Exam and the required advanced simulation scenarios without assistance. An ATC lab is required. Prerequisites: AVIT 464 and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 468. Air Traffic Control:Non-Radar Procedures. 4 Credits.
This course stresses the comprehensive knowledge of ATC non-radar procedures, to include: airspace utilization, flight plans, general control procedures, board management, initial departure separation, IFR clearances to departing aircraft, communication requirements, and separation standards. Class scenarios will emphasize both enroute and terminal structures. To complete this course, the student shall be required to demonstrate and apply the skills and knowledge required to successfully complete a non-radar performance exercise in an ATC lab. Prerequisites: AVIT 260, AVIT 261, and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 480. Advanced Aircraft Operations. 3 Credits.
The topics of study include high speed and high altitude aerodynamics, physiological aspects of high altitude flight, considerations associated with operations near high speed buffet boundaries, effects of turbulence on high speed aircraft, the effects of maneuvering load factors, FAR Part 25 takeoff and landing performance, along with the general study of applied systems management. The student must complete the associated flight lessons to satisfactorily complete the course. No concurrent enrollment allowed with other aviation flight courses. Prerequisites: AVIT 415, AVIT 421, AVIT 428, and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.5. F,S,SS.

AVIT 485. Aviation Senior Capstone. 3 Credits.
This course will explore contemporary and ethical issues in the aviation industry. Students will work in multi-disciplinary teams to examine and solve issues related to global aviation, environmental concerns, technology advances, aviation safety and security practices, labor issues and aviation economics. Students will be required to demonstrate an understanding of information literacy and advanced communications through coursework. Prerequisites: AVIT 403, senior status, and a minimum GPA of 2.5. F,S.

AVIT 490. Methods and Materials in Teaching Aviation I. 2 Credits.
This course will acquaint the student with resources and software used in classroom teaching specific to aviation. Topics covered include teaching with technology, utilizing instructional aids, motivating students, marketing a program and a career exploration in aviation education. Students will also gain the experience of managing the Aerospace Learning Center. Prerequisite: AVIT 414 or consent of instructor; open to Aviation majors and minors only; minimum GPA of 2.5. Repeatable to 6 credits. F.
AVIT 491. Methods and Materials in Teaching Aviation II. 2 Credits.
This course will be a continuation of the work started in Aviation 490 by
providing the student with additional opportunities in the use of resources and
software used in classroom teaching specific to aviation. Additional emphasis
will be placed on the development of course syllabi and lesson plans, delivering
classroom lessons, and the critique, evaluation, and assessment of student
and instructor performance. Students will also gain the experience of managing
the Aerospace Learning Center. Prerequisites: AVIT 414 and Junior or Senior
status or consent of instructor; open to Aviation majors and minors only;
minimum GPA of 2.5. S.

AVIT 497. Aviation Internship. 1-4 Credits.
Aviation internship will provide a student with the actual, on-the-job exposure
of a particular area of interest the student has within the aviation industry.
Internships will be available in airport management, general aviation
management, on both the manufacturer and fixed-base operator level and
within the weather modification industry. The weather modification internship
will be available only with the necessary federal funding or contractor support.
A maximum of 4 credits will be allowed toward graduation. Prerequisites will
vary depending on the area of the internship. Prerequisites: Junior or senior standing with a minimum GPA of 2.5 required; open to Aviation majors and minors only; prerequisites will vary depending on the area of the internship. Repeatable to 6 credits. F,S,SS.

AVIT 499. Readings in Aviation. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a
specific area of expertise. A written report is required. Prerequisites: Senior
standing; open to aviation majors and minors only; minimum GPA of 2.5. Repeatable to 8 credits. F,S,SS.

Banking and Financial Economics

(See Economics (p. 108) listing)

Biochemistry and Molecular Biology (BMB)

http://www.med.und.edu/basic-sciences/

The Department of Basic Sciences offers undergraduate courses in
biochemistry and molecular biology that serve majors and programs across
colleges at UND.

Courses

BMB 301. Biochemistry. 3 Credits.
Topics including enzymology; bioenergetics; metabolism and its regulation;
nucleic acid metabolism; recombinant DNA technology; structure and function
of macromolecules. Prerequisite: CHEM 340 or CHEM 342 or an equivalent
approved by the department. S.

BMB 401. Biochemistry of Proteins and Information Flow. 3 Credits.
This course will build upon the overview of biochemistry and molecular biology
as presented in BMB 301. Topics to be presented include protein structure and
function, enzymology, and the expression and transmission of genetic
information. Prerequisite: BMB 301. F.

BMB 403. Advanced Biochemistry Laboratory. 2 Credits.
Students will demonstrate competency in understanding and performing
physical and molecular techniques commonly used in biomedical research.
Prerequisite: Permission of instructor. Prerequisites or Corequisite: BMB 401. F.

Biology (Biol)

http://www.arts-sciences.und.edu/biology

Boulanger, Carmichael, Darby, D. Darland, T. Darland, Ellis-Felege, Goodwin,
Kelsch, Maru, Meberg (Chair), Newman, Ovtchinnikov, Pyle, Ralph, Rhen,
Sheridan, Simmons, Tkach, Vaughan, and Yurkonis

The Biology Department’s program provides a well-rounded, balanced
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education, which focuses on the development of essential skills for professional
and personal success and a broad exposure to all levels of biological
organization, from molecules to ecosystems. Essential skills fostered in the
We strongly advise mastery of materials in all core courses except BIOL 480 Senior Capstone Seminar prior to enrolling in other 300 or 400 level Biology courses.

No more than one Biology course intended for non-majors (all University of North Dakota 200 level Biology courses) will count toward the 44 hour major.

Students may include no more than ten combined credit hours from BIOL 494 Directed Studies; BIOL 492 Research; BIOL 491 Seminar, and BIOL 489 Senior Honors Thesis towards the total 44 credit hours required for this Biology major.

At least four upper-division Biology courses with laboratories must be included in the 44 hour major. Specifically:

- BIOL 494 Directed Studies, or BIOL 492 Research, may be counted as one upper-division laboratory requirement with appropriate documentation of the laboratory experience and approval by the supervising faculty member and the Biology Department Chairperson prior to taking the research credits.
- Up to two upper-division, life sciences-related laboratory courses (lecture + lab = 1 course) from UND departments outside Biology may be counted toward the four-course upper division laboratory requirement, provided they do not overlap extensively with subject matter in Biology Department courses also being used for credit. See details about non-Biology courses below.

No more than two upper-division, life sciences-related courses (lecture + lab = 1 course) from UND departments outside Biology will count toward the 44 hour major. Specifically:

- One or two of the following courses can be applied toward the 44 credits required for a BS in Biology degree:
  - Select one or two of the following:
    - ANAT 204 & 204L Anatomy for Paramedical Personnel and Anatomy for Paramedical Personnel Laboratory 5
    - ANTH 335 Primates 3
    - ANTH 325 Human Origins 3
    - BMB 401 Biochemistry of Proteins and Information Flow 3
    - BMB 403 Advanced Biochemistry Laboratory 2
    - MBIO 302 & 302L General Microbiology Lecture and General Microbiology Laboratory 4
    - MBIO 328 Introduction to Immunology 3
    - PPT 301 Human Physiology 4
  - BMB 301 Biochemistry will not be allowed
  - MBIO 202 Introductory Medical Microbiology Lecture/MBIO 202L Introductory Medical Microbiology Laboratory will only be allowed with special permission of the Biology department.
  - Only ANAT 204L Anatomy for Paramedical Personnel Laboratory, BMB 403 Advanced Biochemistry Laboratory, and MBIO 302L General Microbiology Laboratory from the above list can be applied toward the requirement for four advanced labs. PPT 301 Human Physiology will not be allowed for the advanced lab requirement.
  - PPT 301 Human Physiology and BIOL 442 Physiology of Organs and Systems/BIOL 442L Physiology of Organs and Systems Laboratory will not both be counted towards the 44 credit requirement for a UND Biology degree.
  - Other courses will be considered on a case by case basis. To have a course considered provide a syllabus to the Department Chair.
  - At least 15 of the total 44 credits required for the BS degree must be taken in the UND Biology department, exclusive of the credits earned in other departments.

B. Advanced requirements for each option (minimum 20 credit hours required):

**Option 1. General Biology**

This program is designed for students interested in obtaining a broad background in biology, with maximum flexibility in program design. Students should consult with their adviser to develop an appropriate course of study.

Advanced requirements (20 credit hours of Biology electives)

All other 300 or 400 level Biology courses will count toward the 20 elective credit hours needed.

**Option 2. Molecular, Cellular, and Developmental Biology**

This program is designed for students interested in the cellular and sub-cellular mechanisms underlying biological phenomena. It is especially appropriate for students anticipating a career in biotechnology or biomedical research. These courses will provide a foundation for students planning to continue their studies in graduate or professional programs, or students wanting to pursue technical positions in life science research or pharmaceutical companies. Students should consult with their adviser to develop an appropriate course of study.

Advanced requirements (minimum 20 credit hours):

**Required courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 341L Cell Biol Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 410 Molecular Biology Techniques</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 378 Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 415 Genomics</td>
<td>4</td>
</tr>
</tbody>
</table>

Select minimum 5 credit hours of the following (Option courses):

<table>
<thead>
<tr>
<th>Course</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 315R Genetics Recitation</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 369 Histology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 369L Histology Lab</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 390 Endocrinology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 450 Molecular Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 460 Molecular Biology of the Cell</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 302 General Microbiology Lecture</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 401 Biochemistry of Proteins and Information Flow Biology electives</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 20

- All 300 or 400 level Biology courses, including any of those not taken from the group above, will count toward the elective credit hours needed.

**Option 3. Ecology and Evolutionary Biology**

This program is designed for students interested in ecology, evolutionary biology, and related areas. Students will explore animal behavior, biodiversity, evolutionary history and interactions of organisms and their environments. The coursework outlined here will familiarize students with the conceptual framework of ecology and evolutionary biology and provide necessary analytical skills and familiarity with the major groups of living organisms. The program will help prepare students for careers with ecological and evolutionary applications and pursuit of graduate degrees in these fields. Students should consult with their adviser to develop an appropriate course of study.

Advanced requirements (minimum 20 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMB 301 Biochemistry of Proteins and Information Flow</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 20
### Biology (Biol)

**Required courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 332L</td>
<td>Gen Ecology Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 376</td>
<td>Animal Biology</td>
<td>3-4</td>
</tr>
<tr>
<td>&amp; BIOL 376L</td>
<td>and Animal Biology Laboratory</td>
<td></td>
</tr>
<tr>
<td>or BIOL 350</td>
<td>Plant Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 470</td>
<td>Biometry</td>
<td>3</td>
</tr>
</tbody>
</table>

Select minimum 5 credit hours of the following (Option courses):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 333</td>
<td>Population Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 338</td>
<td>Animal Behavior</td>
<td></td>
</tr>
<tr>
<td>BIOL 433</td>
<td>Aquatic Ecology</td>
<td></td>
</tr>
<tr>
<td>BIOL 439</td>
<td>Conservation Biology</td>
<td></td>
</tr>
</tbody>
</table>

Biology electives (minimum 8 additional credit hours):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 410</td>
<td>Molecular Biology Techniques</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 415</td>
<td>Genomics</td>
<td></td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td>3</td>
</tr>
<tr>
<td>&amp; GEOL 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 102</td>
<td>The Earth Through Time</td>
<td>3</td>
</tr>
<tr>
<td>&amp; GEOL 102L</td>
<td>and The Earth Through Time Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits**: 30-33

* All 300 or 400 level Biology courses, including any of those not taken from the groups above, will count toward the elective credit hours needed.

### Physical Sciences requirement

Select minimum 3-4 credit hours of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 134</td>
<td>Introduction to Global Climate</td>
<td>3-4</td>
</tr>
<tr>
<td>&amp; GEOG 134L</td>
<td>and Introduction to Global Climate Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOG 471</td>
<td>Cartography and Visualization</td>
<td></td>
</tr>
<tr>
<td>&amp; GEOG 471L</td>
<td>and Cartography and Visualization Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Geographic Information Systems (GIS)</td>
<td></td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td></td>
</tr>
<tr>
<td>&amp; GEOL 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 102</td>
<td>The Earth Through Time</td>
<td></td>
</tr>
<tr>
<td>&amp; GEOL 102L</td>
<td>and The Earth Through Time Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits**: 30-33

### Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3-4</td>
</tr>
<tr>
<td>or MATH 165</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

### Chemistry

#### General Chemistry

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 121L</td>
<td>and General Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 221L</td>
<td>and Fundamentals of Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 254</td>
<td>and Inorganic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 254L</td>
<td>and Inorganic Chemistry I Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

#### Organic Chemistry

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 340L</td>
<td>and Survey of Organic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; BMB 301</td>
<td>and Biochemistry</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 341L</td>
<td>and Organic Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 342</td>
<td>and Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 342L</td>
<td>and Organic Chemistry II Laboratory</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Physical Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 211</td>
<td>College Physics I</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 212</td>
<td>and College Physics II</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 252</td>
<td>and University Physics II</td>
<td></td>
</tr>
</tbody>
</table>

### Statistical Methods and Data Interpretation

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 470</td>
<td>Biometry</td>
<td></td>
</tr>
<tr>
<td>SOE 326</td>
<td>Sociological Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits**: 6-7

* Students with a particular aptitude for mathematics should consider taking both MATH 165 Calculus I and MATH 166 Calculus II and should consult with their advisor regarding this potential option.

** Pre-requisites for either course are the responsibility of the student.

*** The sequence of CHEM 341 Organic Chemistry I and CHEM 342 Organic Chemistry II AND BMB 301 Biochemistry is highly recommended for pre-medicine students because some medical schools require or prefer this combination.

**** BIOL 470 Biometry, required in the Ecology and Evolutionary Biology option. Students working toward options 1 (General Biology) or 2 (Molecular, Cellular, and Developmental Biology) may take BIOL 470 and have those credits count toward biology electives AND satisfy the statistics requirement.

# The chemistry sequence CHEM 221, CHEM 221L, CHEM 254, and CHEM 254L is intended for students with a strong background and interest in chemistry and presumes some exposure to calculus

### Teacher Certification

Students seeking secondary teacher certification in Biology must complete the Department of Teaching and Learning requirements in Secondary Education (see Secondary Education (p. 241) listing).

These students must complete the B.S. with Major in Biology, the B.S. in Molecular and Integrative Biology, the B.S. with Major in Biology (Pre-Health Sciences Emphasis), or the B.S. in Fisheries and Wildlife Biology and include the following three courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 312</td>
<td>Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 336</td>
<td>Systematic Botany</td>
<td></td>
</tr>
<tr>
<td>&amp; MBIO 302</td>
<td>General Microbiology Lecture &amp; MBIO 302L</td>
<td></td>
</tr>
<tr>
<td>&amp; MBIO 302L</td>
<td>and General Microbiology Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

These students must also complete at least four credit hours of earth science from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td></td>
</tr>
<tr>
<td>&amp; GEOL 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEGO 121</td>
<td>Global Physical Environment</td>
<td></td>
</tr>
<tr>
<td>&amp; GEGO 121L</td>
<td>and Global Physical Environment Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEGO 134</td>
<td>Introduction to Global Climate</td>
<td></td>
</tr>
<tr>
<td>&amp; GEGO 134L</td>
<td>and Introduction to Global Climate Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

Other choices of courses in Biology should be made with the aid of a Biology adviser. Among the other requirements for the major, students seeking teacher certification must complete the following option:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 340L</td>
<td>and Survey of Organic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; BMB 301</td>
<td>and Biochemistry</td>
<td></td>
</tr>
<tr>
<td>PHYS 211</td>
<td>College Physics I (lab included)</td>
<td></td>
</tr>
<tr>
<td>PHYS 212</td>
<td>College Physics II (lab included)</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students interested in certification in both Biology and Physics should take
**B.S. with Major in Molecular and Integrative Biology (Options in either Basic Life Science or Enhanced Applied Life Science)**

Study of life science in the past has been largely confined to the intellectual platforms associated with individual levels of biological organization, e.g., molecular biology, cellular biology, physiology of organisms, and ecology. This degree program emphasizes integration of knowledge across levels of biological organization from the gene/molecular/cellular to the development and physiology of individual organisms, along with their adaptation to local environments. The new training model has greater potential to contribute to educational success, medical advances, technological innovation, and commercialization of knowledge. Coursework in the degree provides a strong foundation for students planning to either continue their studies in medical science, graduate, and professional programs (Basic Life Science Option) or pursue technical positions/further training or professional positions in applied health science and biotechnology (Enhanced Applied Life Science Option). Students in the degree program will be encouraged, depending on their interests, to pursue research experiences with faculty in the medical or life sciences, additional coursework suited to the biotechnology industry, internships with regional biotechnology corporations, and cross-disciplinary training in entrepreneurship.

Required 125 credits (Basic Life Science Option) or 138 credits (Enhanced Applied Life Science Option), 36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution, including:

I. Essential Studies (ES) requirements (See University ES listing), minimum 39 total credits. The following courses must be taken as part of the Essential Studies requirement:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 9

II. Core and Advanced Requirements (48 credit hours):

A. Core requirements for both the Basic Life Science and the Enhanced Applied Life Science options (48 hours), all courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; BIOL 151</td>
<td>and General Biology II</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>&amp; BIOL 151L</td>
<td>and General Biology II Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 312</td>
<td>Evolution</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 315</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 332</td>
<td>General Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 341</td>
<td>Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 480</td>
<td>Senior Capstone Seminar **</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 24

* Students who take BIOL 111 Concepts of Biology and BIOL 111L Concepts of Biology Laboratory and earn a grade of "B" or higher in both of those courses prior to becoming a Molecular & Integrative Biology major may complete the General Biology sequence by taking BIOL 150 General Biology I and BIOL 150L General Biology I Laboratory.

** Three credits for an accepted BIOL 489 Senior Honors Thesis can be substituted for the BIOL 480 Senior Capstone Seminar with prior approval of the thesis topic by the Chair of Biology.

We strongly advise mastery of materials in all core courses except BIOL 480 Senior Capstone Seminar prior to enrolling in other 300 or 400 level Biology courses.

No more than one Biology course intended for non-majors (all University of North Dakota 200 level Biology courses) will count toward the 44 hour major.

Students may include no more than 10 combined credit hours from BIOL 494 Directed Studies; BIOL 492 Research; BIOL 491 Seminar; and BIOL 489 Senior Honors Thesis, towards the total 48 credit hours required for this Biology major.

At least four upper-division Biology courses with laboratories must be included in the 48 hour major. Specifically:

- BIOL 494 Directed Studies, or BIOL 492 Research, may be counted as one upper-division laboratory requirement with appropriate documentation of the laboratory experience and approval by the supervising faculty member and the Biology Department Chairperson prior to taking the research credits.
- Up to two upper-division, life sciences-related laboratory courses from the UND departments outside Biology may be counted toward the four-course, upper-division laboratory requirement, provided they do not overlap extensively with subject matter in Biology Department courses also being used for credit. See details about non-Biology courses below.

No more than two upper-division, life sciences-related courses (lecture + lab = 1 course) from UND departments outside Biology will count toward the 48 hour major. Specifically:

- One or two of the following courses can be applied toward the 48 credits required for a BS in Molecular and Integrative Biology degree.
- Select one or two of the following:
  - ANAT 204 Anatomy for Paramedical Personnel
  - ANTH 325 Human Origins
  - ANTH 335 Primates
  - BMB 401 Biochemistry of Proteins and Information Flow
  - BMB 403 Advanced Biochemistry Laboratory
  - MBIO 302 & 302L General Microbiology Lecture and General Microbiology Laboratory
  - MBIO 328 Introduction to Immunology
  - PPT 301 Human Physiology
  - BMB 301 Biochemistry will not be allowed
  - MBIO 202 Introductory Medical Microbiology Lecture/MBIO 202L Introductory Medical Microbiology Laboratory will only be allowed with special permission of the Biology department.
  - Only ANAT 204L Anatomy for Paramedical Personnel Laboratory, BMB 403 Advanced Biochemistry Laboratory and MBIO 302L General Microbiology Laboratory can be applied toward the requirement for four advanced labs. PPT 301 Human Physiology will not be allowed for the advanced lab requirement.
  - PPT 301 Human Physiology and BIOL 442 Physiology of Organs and Systems/BIOL 442L Physiology of Organs and Systems Laboratory will not both be counted towards the 44 credit requirement for the degree.
  - Other courses will be considered on a case by case basis. To have a course considered provide a syllabus to the Department Chair.
  - At least 15 of the total 44 credits required for the BS degree must be taken in the UND Biology department, exclusive of the credits earned in other departments.

B. Advanced requirements for both the Basic Life Science and the Enhanced Applied Life Science options (minimum 24 credit hours):
Note: Basic Life Science Option requires 117-123 total credit hours.

A. Basic Life Science Option (30-36 credit hours):

**Mathematics**

- MATH 146 Applied Calculus I ** 3-4
- or MATH 165 Calculus I

**Chemistry and Biochemistry**

**General Chemistry**

- CHEM 121 General Chemistry I
  - & 121L and General Chemistry I Laboratory
  - & CHEM 122 General Chemistry II
  - & CHEM 122L General Chemistry II Laboratory
  - OR
  - CHEM 221 Fundamentals of Chemistry - Concepts
  - & 221L and Fundamentals of Chemistry Laboratory
  - & CHEM 254 and Inorganic Chemistry I
  - & CHEM 254L and Inorganic Chemistry I Laboratory

**Organic Chemistry**

- CHEM 340 Survey of Organic Chemistry
  - & 340L and Survey of Organic Chemistry Laboratory
  - OR
  - CHEM 341 Organic Chemistry I
    - & CHEM 341L Organic Chemistry I Laboratory
  - OR
  - CHEM 341 Organic Chemistry I
    - & 341L and Organic Chemistry I Laboratory
    - & CHEM 342 and Organic Chemistry II
    - & CHEM 342L and Organic Chemistry II Laboratory

**Biochemistry**

- BMB 301 Biochemistry

**Physical Sciences**

- PHYS 211 College Physics I
  - & PHYS 212 College Physics II
  - OR
  - PHYS 251 University Physics I
    - & PHYS 252 University Physics II

**Statistical Methods and Data Interpretation**

Select one of the following: 3

- BIOL 470 Biometry
- SOC 326 Sociological Statistics
- MATH 321 Applied Statistical Methods

* Students with a particular aptitude for mathematics should consider taking both and and should consult with their advisor regarding this potential option.

** Pre-requisites for either course are the responsibility of the student.

*** The sequence of CHEM 341 Organic Chemistry I and CHEM 342 Organic Chemistry II is highly recommended for pre-medicine students because some medical schools require or prefer this combination.

### The chemistry sequence CHEM 221, CHEM 221L, CHEM 254, and CHEM 254L is intended for students with a strong background and interest in chemistry and presumes some exposure to calculus.

Note: Enhanced Applied Life Science Option requires 132-138 total credit hours.

IV. Additional recommendations.

The coursework outlined for the B.S. degree in Molecular and Integrative Life Science builds a strong foundation for further work in either Basic Life Science or Enhanced Applied Life Science. As students progress through the B.S. degree in Molecular and Integrative Life Science, they are encouraged to seek out additional experiential learning opportunities. In either of the
options, students are encouraged to get additional research experience working in the labs of individual faculty associated with the degree program. As students continue to progress through the program they should also explore opportunities for indepth research experiences, including:

**Basic Life Science Option:** In their Junior and Senior years, students in this option are strongly encouraged to participate in independent summer research internships in the laboratories of UND faculty associated with either the Molecular and Integrative Life Science program or the School of Medicine and Health Sciences.

**Enhanced Applied Life Science Option:** In their Junior and Senior years, students interested in a career in the biotechnology industry are strongly encouraged to pursue internships in regional biotech corporations and at a minimum take the following courses in entrepreneurship:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTR 250</td>
<td>Imagination, Creativity and Entrepreneurial Thinking</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 290</td>
<td>Venture Initiation</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Summer research opportunities in faculty labs and the biotechnology industry are highly competitive. Students are encouraged to engage faculty and regional biotech corporations early in their program of study regarding the availability of such opportunities. They should also discuss with their faculty adviser the potential for receiving course credit for these activities.

**Description of Recommended Courses in Entrepreneurship**

**ENTR 250. Imagination, Creativity and Entrepreneurial Thinking. 3 Credits.**
Do you know that creativity can be learned? It is a process. You can become more creative! Together we explore creative processes, dispel creativity myths, and help you cultivate opportunity recognition and creative problem solving. You will work individually, and we will work in teams, to expand your creativity and entrepreneurial mindset. This is an intensely experiential course, come experience it with us. F.S.

**ENTR 290. Venture Initiation. 3 Credits.**
Have you ever seen a product and thought to yourself, “I thought of that first!” Although ideas are important, ideas don’t affect your life, others’ life, unless they are brought to fruition. In this course, you will learn to determine whether or not your idea “will sell.” You will learn how to refine your idea so that it “will sell,” or when to “pivot” and go in a different direction. Fair warning to introverts, you will need to spend a lot of time outside the classroom interacting with people. It’s fun...really!. F.S.

**B.S. with Major in Biology (Pre-Health Sciences Emphasis)**

This program is designed for students interested in medicine or allied medical fields such as dentistry, veterinary medicine, or medical research. Pre-health students should consult with their Biology adviser and the pre-health adviser in the College of Arts and Sciences to develop an appropriate course of study.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution), including:

I. Essential Studies requirements (see University ES listing, minimum 39 total credits). The following courses must be taken as part of the Essential Studies requirement:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

II. 44 major hours including:

A. Core requirements or each option (24 credit hours), all courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; BIOL 151</td>
<td>and General Biology II</td>
<td>6</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>&amp; BIOL 151L</td>
<td>and General Biology II Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

B. BIOL 312  | Evolution                                  | 3       |
| BIOL 315    | Genetics                                   | 3       |
| BIOL 332    | General Ecology                            | 3       |
| BIOL 341    | Cell Biology                               | 3       |
| BIOL 480    | Senior Capstone Seminar                    | 3       |
| Total Credits |                                        | 24      |

* Students who take BIOL 111 Concepts of Biology and BIOL 111L Concepts of Biology Laboratory and earn a grade of “B” or higher in both of those courses prior to becoming a Molecular & Integrative Biology major may complete the General Biology sequence by taking BIOL 150 General Biology I and BIOL 150L General Biology I Laboratory.
** Three credits for an accepted BIOL 489 Senior Honors Thesis can be substituted for the BIOL 480 Senior Capstone Seminar with prior approval of the thesis topic by the Chair of Biology.

We strongly advise mastery of materials in all core courses except BIOL 480 Senior Capstone Seminar prior to enrolling in other 300 or 400 level Biology courses.

No more than one Biology course intended for non-majors (all University of North Dakota 200 level Biology courses) will count toward the 44 hour major.

Students may include no more than 10 combined credit hours from BIOL 494 Directed Studies; BIOL 492 Research; BIOL 491 Seminar; and BIOL 489 Senior Honors Thesis, towards the total 44 credit hours required for this Biology Major.

At least four upper-division Biology courses with laboratories must be included in the 44 hour major. Specifically:

- BIOL 494 Directed Studies, or BIOL 492 Research may be counted as one upper-division laboratory requirement with appropriate documentation of the laboratory experience and approval by the supervising faculty member and the Biology Department Chairperson prior to taking the research credits.
- Up to two upper-division, life sciences-related laboratory courses from UND departments outside Biology may be counted toward the four-course, upper-division laboratory requirement, provided they do not overlap extensively with subject matter in Biology Department courses also being used for credit. See details about non-Biology courses below.

No more than two upper-division, life sciences-related courses (lecture + lab = 1 course) from the UND School of Medicine and Health Sciences will count toward the 44 hour major. Specifically:

- One or two of the following courses from UND departments outside Biology can be applied toward the 44 credits required for a BS in Biology degree.
- Select one or two of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
</tbody>
</table>
  & 204L      | and Anatomy for Paramedical Personnel     | 5       |
  | ANTH 325    | Human Origins                             | 3       |
  | ANTH 335    | Primates                                  | 3       |
  | BMB 401     | Biochemistry of Proteins and Information Flow | 3   |
  | BMB 403     | Advanced Biochemistry Laboratory          | 2       |
  | MBIO 302 & 320L | General Microbiology Lecture             | 4       |
  & General Microbiology Laboratory |         |
  | MBIO 328    | Introduction to Immunology                | 3       |
  | PPT 301     | Human Physiology                          | 4       |
  | BMB 301     | Biochemistry will not be allowed          |         |
BIOLOGY DEPARTMENT

III. Cognate requirements in other departments (30-33 credit hours):

B. Advanced requirements (minimum 20 credit hours):

Select minimum 12 credit hours of the following (Upper-Level Courses): 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 341</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>&amp; 341L &amp; 341L</td>
<td>and Organic Chemistry I Laboratory</td>
</tr>
<tr>
<td>&amp; BMB 301</td>
<td>and Biochemistry</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>&amp; 341L &amp; 341L</td>
<td>and Organic Chemistry I Laboratory</td>
</tr>
<tr>
<td>&amp; CHEM 342</td>
<td>and Organic Chemistry II</td>
</tr>
<tr>
<td>&amp; CHEM 342L</td>
<td>and Organic Chemistry II Laboratory</td>
</tr>
</tbody>
</table>

Physical Sciences

PHYS 211 | College Physics I
& PHYS 212 | and College Physics II
OR
PHYS 251 | University Physics I
& PHYS 252 | and University Physics II

Statistical Methods and Data Interpretation

Select one of the following: ****

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 470</td>
<td>Biometry</td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
</tr>
<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
</tr>
</tbody>
</table>

* Students with a particular aptitude for mathematics should consider taking both MATH 165 Calculus I and MATH 166 Calculus II and should consult with their adviser regarding this potential option.
** Prerequisites for either course are the responsibility of the student.
*** The sequence of CHEM 341 Organic Chemistry I and CHEM 342 Organic Chemistry II AND BMB 301 Biochemistry is highly recommended for pre-medicine students because some medical schools require or prefer this combination.
**** Students may take BIOL 470 and have those credits count toward biology electives AND satisfy the statistics requirement.
# The chemistry sequence CHEM 221, CHEM 221L, CHEM 254, and CHEM 254L is intended for students with a strong background and interest in chemistry and presumes some exposure to calculus.

B.S. with Major in Fisheries and Wildlife Biology

The Department offers a four-year program leading to the degree of Bachelor of Science in Fisheries and Wildlife Biology. Students completing this program are qualified to obtain positions with state, federal and private fisheries and wildlife organizations.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies requirements (see University ES listing, minimum 39 total credits). The following courses must be taken as part of the Essential Studies requirement:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
</tbody>
</table>

Total Credits 9

II. The following curriculum:

56-58 major hours, including:

Basic Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 121</td>
<td>Introduction to Fisheries and Wildlife Biology</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
</tr>
<tr>
<td>&amp; BIOL 151</td>
<td>and General Biology II</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
</tr>
<tr>
<td>&amp; BIOL 151L</td>
<td>and General Biology II Laboratory</td>
</tr>
<tr>
<td>BIOL 312</td>
<td>Evolution</td>
</tr>
<tr>
<td>BIOL 315</td>
<td>Genetics</td>
</tr>
<tr>
<td>BIOL 332</td>
<td>General Ecology</td>
</tr>
<tr>
<td>&amp; 332L</td>
<td>and Gen Ecology Lab</td>
</tr>
</tbody>
</table>

Organic Chemistry

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
</tr>
<tr>
<td>&amp; 340L</td>
<td>and Survey of Organic Chemistry Laboratory</td>
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<td>&amp; BMB 301</td>
<td>and Biochemistry</td>
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Chemistry

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<td>CHEM 121 &amp; 121L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
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<td>&amp; CHEM 122 &amp; 122L</td>
<td>and General Chemistry II and General Chemistry II Laboratory</td>
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<td>OR</td>
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<tr>
<td>CHEM 221 &amp; 221L</td>
<td>Fundamentals of Chemistry - Concepts and Fundamentals of Chemistry Laboratory</td>
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<td>&amp; CHEM 254 &amp; 254L</td>
<td>and Inorganic Chemistry I and Inorganic Chemistry I Laboratory #</td>
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Mathematics

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<td>Applied Calculus I **</td>
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<td>or MATH 165</td>
<td>Calculus I</td>
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General Chemistry

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<td>CHEM 221 &amp; 221L</td>
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Introduction to Immunology

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<tr>
<td>MBIO 328</td>
<td>Introduction to Immunology</td>
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Total Credits 8

* All 300 or 400 level Biology courses, including any of those not taken from the group above, will count toward the elective credit hours needed.
Minor in Biology (minimum 20 hours required)

Required 20 hours, including:

**BIOL 150** General Biology I
& **BIOL 151** and General Biology II

**BIOL 150L** General Biology I Laboratory
& **BIOL 151L** and General Biology II Laboratory

**BIOL 315** Genetics
or **BIOL 341** Cell Biology

**AND**

**BIOL 312** Evolution
or **BIOL 332** General Ecology

Electives 6

All other 300 or 400 level biology courses, including those listed above that have not already been taken to meet the minor requirements, will count toward the 20 hour minor.

No more than one UND life science course from outside the Biology Department may be counted toward completion of the minor.

**Courses**

**BIOL 111. Concepts of Biology. 3 Credits.**

Intended for non-science majors seeking general knowledge and cultural appreciation of contemporary biology. F.S.

**BIOL 111L. Concepts of Biology Laboratory. 1 Credit.**

A basic biology laboratory to complement BIOL 111. Prerequisite or Corequisite: BIOL 111, F.S.

**BIOL 120. Orientation to the Biology Major. 1 Credit.**

An introduction to careers available to students majoring in Biology and the coursework and other experiences valuable in pursuing those careers. S/U grading. F.

**BIOL 121. Introduction to Fisheries and Wildlife Biology. 1 Credit.**

This seminar will introduce Fisheries Wildlife Biology Majors to their program curriculum and profession. Topics will include the history and future directions of the Fish Wildlife Profession, specialties within the profession, coursework and training necessary for professional preparation, and potential opportunities for field experience during undergraduate education. Students will also meet fisheries and Wildlife Biologists working for state or federal agencies or non-governmental organizations to learn what they do and about opportunities for employment. Prerequisite: Permission of the instructor. F.

**BIOL 150. General Biology I. 3 Credits.**

Basic concepts of biology with emphasis on the process of science, metabolism, cell biology, plant and animal form and function, and physiology. Broadly designed to satisfy the needs of those pursuing biological and preprofessional curricula. F.

**BIOL 150L. General Biology I Laboratory. 1 Credit.**

A contemporary biology laboratory to complement BIOL 150, 151. Prerequisite or Corequisite: BIOL 150, F.

**BIOL 151. General Biology II. 3 Credits.**

Basic concepts of biology with emphasis on the process of science, genetics, molecular biology, evolution, biodiversity, and ecology. Broadly designed to satisfy the needs of those pursuing biological and preprofessional curricula. S.

**BIOL 151L. General Biology II Laboratory. 1 Credit.**

A contemporary biology laboratory to complement BIOL 150, 151. Prerequisite or Corequisite: BIOL 151, S.

**BIOL 312. Evolution. 3 Credits.**

A study of the processes that have led from the origin of life to the diverse patterns and forms of life observable today. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S.

**III Cognate courses required in other departments:**

**Math**

MATH 146  Applied Calculus I  3-4
or MATH 165  Calculus I

**Chemistry**

CHEM 121  General Chemistry I & 121L and General Chemistry I Laboratory  4

CHEM 122  General Chemistry II & 122L and General Chemistry II Laboratory  4

**Physical Sciences**

GEOL 101  Introduction to Geology & 101L and Introduction to Geology Laboratory  4
or PHYS 211  College Physics I

**Geography**

GEOG 474  Introduction to Geographic Information Systems (GIS) & 474L and GIS Laboratory  3

**Total Credits**  18-19
BIOL 312R. Evolution Recitation. 1 Credit.
Students use computer simulations and case studies to explore concepts given in BIOL 312 lecture, and prepare a scientific poster to communicate their findings to peers. Prerequisites: BIOL 150 and BIOL 151. Corequisite: BIOL 312. S.

BIOL 315. Genetics. 3 Credits.
An introduction to genetics, with emphasis on classical genetic analysis and the biochemistry of gene transmission, expression and regulation. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F.

BIOL 315R. Genetics Recitation. 1 Credit.
A recitation to aid students enrolled in BIOL 315: Genetics. The class is designed to review both "big idea" concepts from lecture as well as to work through genetics problems. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Corequisites: BIOL 315. F.

BIOL 320. Forensic Biology. 3 Credits.
Forensic biology is the application of biological sciences to matters of law. This course covers the concept of biological evidence and focuses on human identification using the serological and genetic methods. This is one of the courses that the American Academy of Forensic Sciences recommends for forensic scientists. Prerequisites: BIOL 150 and BIOL 151. S.

BIOL 332. General Ecology. 3 Credits.
An introduction to ecology. Covers the relationship of individuals, populations, communities and ecosystems to their biotic and abiotic environments. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F.

BIOL 332L. Gen Ecology Lab. 1 Credit.
Field projects and laboratory exercises to complement BIOL 332. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Prerequisite or Corequisite: BIOL 332. F.

BIOL 333. Population Biology. 3 Credits.
Principles of population genetics, population ecology, and evolution in plants and animals. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and MATH 93 or higher. S.

BIOL 336. Systematic Botany. 4 Credits.
Morphology, evolution, and classification of vascular plants with emphasis on the flora of the Great Plains. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or permission of instructor. F, even years.

BIOL 338. Animal Behavior. 2 Credits.
Studies in animal social behavior. The influences of environmental factors on behavior is emphasized. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L or an equivalent approved by the department. S, even years.

BIOL 341. Cell Biology. 3 Credits.
Description of processes common to life at the cellular level including: biochemical and structural organization, membrane function, motility, signal transduction, growth, division and genetic regulation of the cell. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L. Prerequisite or Corequisite: CHEM 122. S.

BIOL 341L. Cell Biol Lab. 1 Credit.
Laboratory investigation utilizing techniques to study life at the cellular level including chemical composition and characterization, enzyme kinetics, metabolism and microscopy. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L. Prerequisites or Corequisites: BIOL 341, CHEM 122. S.

BIOL 350. Plant Biology. 3 Credits.
Structure and function of plants at the cellular, tissue, and whole plant levels. Topics also include ecological adaptations and plant-derived products. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or permission of instructor. S, odd years.

BIOL 360. Soil Ecology. 3 Credits.
This course will survey the abundance, distribution, and identity of biota that are present in soils, their ecological functions, methods of analysis, contemporary theories about soil ecology, and practical methods of promoting soil health in natural and managed systems. Prerequisites: BIOL 150, BIOL 151, and BIOL 332, or consent of instructor. S, odd years.

BIOL 363. Entomology. 4 Credits.
Structure, functions, life history, classification, habits and distribution of insects. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F, even years.

BIOL 364. Parasitology. 2 Credits.
Classification, structure, functions, and life-cycles of parasites having importance to human, wildlife and veterinary health. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. F, odd years.

BIOL 364L. Parasitology Laboratory. 2 Credits.
A basic parasitology laboratory to complement BIOL 364. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. Prerequisite or Corequisite: BIOL 364. F.

BIOL 369. Histology. 2 Credits.
Microscopical anatomy of vertebrate tissues and organs, with emphasis on man and other mammals. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S.

BIOL 369L. Histology Lab. 2 Credits.
A basic histology laboratory to complement BIOL 369. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. Prerequisite or Corequisite: BIOL 369. S.

BIOL 376. Animal Biology. 3 Credits.
Evolution, morpho-anatomy, development, reproduction and other aspects of the natural history of invertebrate and vertebrate animals. Prerequisites: BIOL 150 and BIOL 151. S.

BIOL 376L. Animal Biology Laboratory. 1 Credit.
Observation of live or fixed animals belonging to various invertebrate and vertebrate groups with emphasis on their adaptations to environment/life styles. Laboratory projects will include some of the classical and modern techniques used in systematic studies. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Corequisite: BIOL 376. S.

BIOL 378. Developmental Biology. 3 Credits.
An overview of general stages and mechanisms of development, experimental approaches used to study developmental processes, and genetic and environmental influences that govern development. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and MATH 93 or higher. S.

BIOL 378L. Developmental Biology Lab. 1 Credit.
Developmental Biology Lab is a one-credit class designed to complement the Developmental Biology Course (BIOL 378). In the laboratory students will be learning and applying a series of analytical and technical skills using a hands-on approach to fundamental developmental concepts. Students should come away from the course with a set of observational and technical skills as well as practical training in clear and accurate scientific documentation. Emphasis will be placed on the scientific method, data analysis, and effective written communication of results. Counts as an upper-division laboratory course. Prerequisite or Corequisite: BIOL 378. F.

BIOL 380. Disease Biology. 3 Credits.
A survey of the nature and etiology of infectious and parasitic disease in animals, pathogenicity and ways of transmission of most important disease agents and effect of disease on individual organisms and populations. Particular attention is given to emerging zoonotic diseases transmissible between animals and humans, and between wild and domestic animals. Prerequisites: BIOL 150 and BIOL 151. S, odd years.

BIOL 390. Endocrinology. 3 Credits.
This course focuses on the endocrine system of vertebrates. Students will learn how endocrine glands synthesize and secrete hormones and how hormones regulate gene expression, cell proliferation, cell differentiation, and cell physiology. Students build on these basic ideas to understand endocrine control of important developmental and physiological processes. Examples of positive and negative feedback loops will be presented throughout the semester. This reinforces the idea that endocrine glands and hormones work together as an integrated system to maintain homeostasis and produce complex biological cycles. Common endocrine disorders like diabetes mellitus, obesity, dyslipidemia (abnormal cholesterol levels), osteoporosis, erectile dysfunction, and polycystic ovary syndrome will be discussed. In summary, hormones produced by endocrine glands are required for normal development, survival, and reproduction. Prerequisites: BIOL 150, BIOL 151, and CHEM 122. F.
BIOL 396. Fisheries and Wildlife Biology Pre-Internship Seminar. 1 Credit.
The goal of this course is for students to identify internship opportunities to fulfill
the required Cooperative Education internship requirement in the fisheries and
wildlife biology major and to learn the necessary skills for successfully obtaining
an internship and positions in the profession. Prerequisite or Corequisite:
BIOL 121. F.

BIOL 397. Cooperative Education. 1-8 Credits.
A practical work experience with an employer under the direction of a
supervisory faculty member. A written final report will be required and will
be used as a basis for evaluation. Prerequisites: Sophomore standing and
approval by the department chair and acceptance by a supervisory faculty
member. Repeatable to 24 credits. S/U grading. F,S,SS.

BIOL 410. Molecular Biology Techniques. 4 Credits.
Applications of DNA and RNA analysis and recombinant DNA technologies,
emphasizing practical experience in the laboratory. This class will meet twice
a week for 50 minutes in the classroom, and students will be expected to work
approximately 4-6 hours a week in the lab during open lab times. Counts as an
upper-division laboratory course. Prerequisite: BIOL 315 is recommended. F,S.

BIOL 415. Genomics. 4 Credits.
Genomics describes the determination of the complete nucleotide sequence of an
organism and subsequent analyses to decode the structural and functional
information of all genes and regulatory sequences in the genome. This four-credit course will consist of lectures, computer lab sessions, in-class
exercises, take-home assignments, student presentations, and discussion of
research articles. Counts as an upper-division laboratory course. Prerequisites:
BIOL 150, BIOL 150L, BIOL 151, BIOL 151L and BIOL 315. S.

BIOL 416. Ecological Genomics. 3 Credits.
The objective of this course is to introduce students to the theories, vocabulary,
and techniques used in the field of Ecological Genomics, which are drawn from
ecology, genomics, evolution, and population genetics. Counts as an upper-
division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151,
BIOL 151L, BIOL 315, and BIOL 332. Prerequisite or Corequisite: BIOL 312. S,
even years.

BIOL 418. Systems Biology. 4 Credits.
Living organisms are complex systems composed of numerous interacting
parts. Systems biology seeks to understand biological phenomena by
integrating the coordinated action of many components of a system using a
multidisciplinary approach. This class introduces basic concepts and methods
in systems biology with an emphasis on biological networks, gene regulation,
intracellular signaling, development and pattern formation, metabolism, and
the analysis of high-throughput "omics" data. Computer simulations are used
heavily to gain deeper insight into system function. Counts as an upper-division
laboratory course. Prerequisites: BIOL 315, BIOL 341, and MATH 103. S.

BIOL 420. Neuroscience. 3 Credits.
A course covering fundamental areas of neuroscience including neuroanatomy,
cell and molecular neurobiology, sensory systems, motor systems, regulatory
systems, nervous system development, and cognitive and behavioral
neuroscience. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and
junior standing. F.

BIOL 425. Ichthyology. 3 Credits.
Structure and function, anatomy, physiology, behavior, classification,
distribution and ecologic aspects of fishes. Counts as an upper-division
laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and
BIOL 151L or an equivalent approved by the department. F, even years.

BIOL 426. Birds & Mammals. 4 Credits.
Birds and Mammals is designed to familiarize students with avian and
mammalian biology, including anatomy and physiology, behavior, ecology,
evolution and conservation. Lab exercises will be integrated with lecture to
emphasize taxonomy and identification. Counts as an upper-division laboratory
course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. S.

BIOL 430. Human Dimensions of Wildlife and Fisheries. 3 Credits.
This course explores interactions among humans and fisheries and wildlife
resources, with a focus on principles important for understanding and
addressing wildlife management. Topics will include public attitudes,
expectations and diverse values of fisheries and wildlife resources; stakeholder
engagement; public relations; governance; philosophy and ethics of resources
use and management; and human dimensions research methodology.
Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. S, odd years.

BIOL 431. Wildlife Management. 4 Credits.
Theory and methods of management of wildlife populations. Counts as
an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L,
BIOL 151, and BIOL 151L or an equivalent approved by the department. F, odd
years.

BIOL 432. Techniques in Wildlife Population Assessment. 4 Credits.
Techniques in Wildlife Population Assessment is a course designed to teach
wildlife biology students the techniques used to assess wildlife populations for
conservation and management. Students learn the appropriate situations to use
the techniques, how to properly conduct the procedures, how to collect data
from the use of these techniques, and how to report the findings to a variety of
audiences. The structure of the course is designed to teach students proper
research methodology so that they not only know how and when to use the
techniques, but also how they can apply their findings to make appropriate
management recommendations for wildlife conservation and management
under a variety of settings or conditions. Prerequisites: BIOL 150, BIOL 150L,
BIOL 151, and BIOL 151L. F, even years.

BIOL 433. Aquatic Ecology. 3 Credits.
Analysis of the relationships between organisms and their physical, chemical
and biological environments in freshwater ecosystems. Prerequisites:
BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by
the department. S, odd years.

BIOL 435. Large Mammal Ecology and Management. 3 Credits.
A course covering details of the population ecology, specialized management
approaches and techniques, and conservation of large-bodied mammals in
North America and worldwide. Prerequisites: BIOL 150, BIOL 150L, BIOL 151,
and BIOL 151L. Corequisites: BIOL 332 and BIOL 332L. F, odd years.

BIOL 438. Fisheries Management. 3 Credits.
Concepts and approaches to the management of freshwater fisheries. Course
will include discussion of life histories and requirements of important regional
sport fishes. Counts as an upper-division laboratory course. Prerequisites:
BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or instructor permission. S,
even years.

BIOL 439. Conservation Biology. 3 Credits.
A course that integrates information from the disciplines of ecology, genetics,
bio geography, economics, environmental policy, and ethics towards
understanding how to maintain and restore biological diversity. F, odd years.

BIOL 442. Physiology of Organs and Systems. 3 Credits.
Study of the physiology of organs and organ systems in vertebrates.
Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and Junior or
Senior standing or an equivalent approved by the department. F.

BIOL 442L. Physiology of Organs and Systems Laboratory. 1 Credit.
A physiology laboratory to complement BIOL 442. Counts as an upper-
division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151,
and BIOL 151L or and equivalent approved by the department. F.

BIOL 450. Molecular Genetics. 2 Credits.
Topics will include basic molecular genetic mechanisms, recombinant DNA
technology, the organization and function of the cell nucleus, and the molecular
control of gene expression. Prerequisites: BIOL 150, BIOL 150L, BIOL 151,
BIOL 151L, and BIOL 315 or and equivalent approved by the department. On
demand.

BIOL 460. Molecular Biology of the Cell. 3 Credits.
A study of the structure and organization of the cell with a special emphasis
on genetic regulation of the cell division cycle, the genetic basis of cancer, and
the role of genes in the immune system. Prerequisites: BIOL 150, BIOL 150L,
BIOL 151, BIOL 151L, and BIOL 315 or and equivalent approved by the
department. On demand.

BIOL 470. Biometry. 4 Credits.
Analysis of biological data. Covers descriptive statistics, inferential statistics
(e.g.; t-tests, goodness-of-fit tests, regression, ANOVA and non-parametric
tests), and interpreting and presenting statistical results. Prerequisites:
BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or and equivalent approved by
the department. F.
BIOL 480. Senior Capstone Seminar. 3 Credits.
Key aspects of scientific inquiry and communication are investigated and assessed. Students will participate in discussions of relevant current issues in biology and will develop an independent research project. This course provides an opportunity for students to integrate and apply knowledge and skills obtained in biology. Prerequisite: BIOL 312, BIOL 315, BIOL 332, BIOL 341 and senior status in biological science or permission of instructor. F.S.

BIOL 481. Fisheries & Wildlife Senior Capstone. 3 Credits.
Key aspects of scientific inquiry and communication are investigated and assessed. Students will participate in discussions of relevant current issues in fisheries and wildlife biology and will complete an independent research project. The course provides an opportunity for students to integrate and apply knowledge and skills acquired in fisheries and wildlife biology. Prerequisites: BIOL 312, BIOL 315, BIOL 332 and senior status in Fisheries and Wildlife Biology or permission of the instructor. S.

BIOL 488. Senior Honors Thesis. 1-15 Credits.
Supervised independent study culminating in a thesis. Prerequisites: Consent of the department and approval of the honors committee. Repeatable to 15 credits. F.S.

BIOL 491. Seminar. 1 Credit.
Discussion of selected topics in advanced biology, a different topic each semester. Prerequisite: Major or minor in biology. Repeatable to 4 credits. On demand.

BIOL 492. Research. 1-4 Credits.
Research conducted under the supervision of a faculty member. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and consent of instructor. Repeatable to 16 credits. F.S.

BIOL 494. Directed Studies. 1-4 Credits.
Designed to meet the needs of individual students in the areas of faculty specialization. Prerequisite: Consent of instructor. Repeatable to 9 credits. F.S.

BIOL 499. Special Topics. 1-4 Credits.
Important and current topics in biology not covered by other courses. Repeatable when topics vary. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or consent of instructor. Repeatable. On demand.

Business Administration (BAdm)
http://www.business.und.edu

Minor in International Business (For Business Majors Only)
The College of Business and Public Administration provides undergraduate business students with the opportunity to earn a minor in international business. The minor requires a minimum of 24 semester hours: nine hours from various international business courses, nine hours from various arts and sciences courses focused on global issues, and achievement of a Level II proficiency in a language (8 hours) or approved study abroad (6 hours).

Required 24-26 hours, including:
Select three of the following: 9
- ACCT 380 International Accounting
- ECON 338 International Economics
- ECON 380 Global Economic Development
- ECON 438 International Money and Finance
- FIN 430 International Financial Management
- MGMT 420 Multinational Management
- MRKT 325 International Marketing
Select three of the following: 9
- ANTH 171 Introduction to Cultural Anthropology
- GEOG 161 World Regional Geography
- HIST 102 Western Civilization II
- POLS 220 International Politics
- POLS 225 Comparative Politics
Completion of Level II Proficiency in a language (8 hours) or approved study abroad (6 hours).

Completion of B.B.A. or B.Acc. degree
Total Credits 24-26
* Only one of the above economic courses may be used.

Minor in Chinese Studies: Culture and Business
The minor in Chinese Studies: Culture and Business is offered through the College of Business and Public Administration and is open to all students across campus. The Chinese Studies minor provides a formal, structured, multidisciplinary approach to the study of modern China, its history, language, customs, culture, and economy. The program targets students from all majors for in-depth examination of a region of growing global importance with special emphasis on the practical development of cross-cultural business skills. The minor requires a minimum of 23 credits in three different categories: Chinese language, area studies and business. It also requires fieldwork or an internship experience in China.

Program Requirements: a minimum of 23 credits distributed between Parts A, B and C as follows:

Language (Part A)
- CHIN 101 First Year Chinese I 4
- CHIN 102 First Year Chinese II 4

Area Studies (Part B)
Select two of the following: 6
- CHIN 305 Chinese Culture Through Films
- CHIN 306 Introduction to Chinese Calligraphy
- HIST 362 Modern China
- RELS 315 Daoism and Confucianism
- GEOG 463 Regional Geography
- ENGL 299 Special Topics

Business Studies (Part C)
- BADM 316 Introduction to Business in China 3
- BADM 318 China Then and Now 6
- BADM 319 and Business Fieldwork in Shanghai (summer in China)
- or BADM 497 Internship in China

Total Credits 23

Minor in Sport Business
The College of Business and Public Administration provides undergraduate students with the opportunity to earn a minor in sport business. The minor requires a minimum of 21 semester hours described below.

Students receive a conceptual grounding in sport-specific business thought through coursework as well as experience in the sports field through internship opportunities. Students are encouraged to select a major which corresponds to a sport career choice of interest. Options are covered in the Introduction to Sport Business course requirement. Internship experiences also expose students to sport business career options and serve as a networking tool so vital in the sports industry. Students will be assisted in the identification of internship options; however, students are ultimately responsible for acquiring a meaningful internship position. Students may also be required to relocate for the duration of the internship.

Required Credits
- SPRT 205 Introduction to Sport Business 3
- SPRT 320 Sport Financial Management 3
- SPRT 330 Sport Law 3
- SPRT 395 Special Topics in Sport Business 3
- SPRT 440 Sport Branding and Sponsorship 3
- SPRT 450 Facility and Event Planning 3
- SPRT 497 Internship in Sport Business 3
- or SPRT 397 Cooperative Education in Sport Business
The College of Business and Public Administration offers two courses under the BAdm prefix that are available to any student on campus. Our Introduction to Business course fulfills essential studies requirements and provides students with an overview of all business topics. BAdm 395 courses are generally restricted to business majors. The purpose of these courses is to provide special interest courses for particular groups of students. The course title and number may also be used for experimental courses which may later be established as regular offerings within departments or programs.

**BADM Courses**

**BADM 101. Introduction to Business. 3 Credits.**
An essential studies business course and the first step in a well-planned learning agenda that prepares students to become contributing citizens capable of making astute personal economic decisions. Topics covered include economic environment, global competition, entrepreneurship, general and human resources management, marketing, accounting, finance, information systems, and challenges of business careers. In order to foster students' ability to think critically, the course emphasizes an integrated approach that provides opportunities for synergy among various business functions. F,S,SS.

**BADM 105. Career Development I. 1 Credit.**
This course is the first in a series of four courses designed to address career exploration processes. Through this series of courses, important topics such as exploring career interests, developing a resume, improving interview skills, learning effective networking skills, and working with a mentor are covered. Prerequisite: CoBPA pre-majors and majors only. F.S.

**BADM 106. Career Development II. 1 Credit.**
This course is the second in a series of four courses designed to address career exploration processes. Through this series of courses, important topics such as exploring career interests, developing a resume, improving interview skills, learning effective networking skills, and working with a mentor are covered. Prerequisite: BADM 105 and CoBPA pre-majors and majors only with sophomore or above standing. F.

**BADM 205. Career Development III. 1 Credit.**
This course is the third in a series of four courses designed to address career exploration processes. Through this series of courses, important topics such as exploring career interests, developing a resume, improving interview skills, learning effective networking skills, and working with a mentor are covered. Prerequisites: BADM 105, BADM 106, and CoBPA pre-majors and majors only with Junior or above standing. S.

**BADM 206. Career Development IV. 1 Credit.**
This course is the fourth in a series of four courses designed to address career exploration processes. Through this series of courses, important topics such as exploring career interests, developing a resume, improving interview skills, learning effective networking skills, and working with a mentor are covered. Prerequisites: BADM 105, BADM 106, BADM 206 and CoBPA majors only with Senior standing. F.S.

**BADM 316. Introduction to Business in China. 3 Credits.**
An overview of China's past, present and future with particular emphasis on cross-cultural business skills and doing business in China today. S.

**BADM 318. China Then and Now. 3 Credits.**
Offered only in China, this course examines China’s culture, customs, politics, and artistic heritage through existing monuments, temples, historic residences, city structures and artifacts. SS.

**BADM 319. Business Fieldwork in Shanghai. 3 Credits.**
Offered only in China, this course exposes students to the practical problems associated with conducting business in China through lectures and fieldwork. SS.

**BADM 395A. Special Topics. 1-4 Credits.**
Specially arranged seminars, courses, or independent study on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved. BADM 395A-B repeatable to 12 credits. Repeatable to 9 credits. F,S,SS.

**BADM 395B. Special Topics. 1-4 Credits.**
Specially arranged seminars, courses, or independent study on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved. BADM 395A-B repeatable to 9 credits. Repeatable to 9 credits. S/U grading. F,S,SS.

**BADM 397. Internship in China. 1-6 Credits.**
Approval of Director of International Business Programs required. On the job work experience (may be compensated or not) in various areas of business in China. Prerequisite: Approval of the Director of International Business Programs. S/U grading.

**SPRT Courses**

**SPRT 205. Introduction to Sport Business. 3 Credits.**
An overview of the business of sport, including career opportunities. A study of the value of professional business practices to sport organizations. F.S.

**SPRT 310. Economics of Sport. 3 Credits.**
Application of micro and macro economic theory to the analysis of sports markets. Prerequisites: ECON 201 and SPRT 205. On demand.

**SPRT 320. Sport Financial Management. 3 Credits.**
Application of financial theories to the sport industry. Addresses how sport entities such as professional sport franchises, professional sport leagues, university athletic departments and government-funded programs operate from a financial standpoint. Prerequisite: SPRT 205. F.

**SPRT 330. Sport Law. 3 Credits.**
Identification and analysis of legal issues, and the ramifications of these issues as they relate to the sports industry. Includes coverage of contracts, antitrust law, labor relations, collective bargaining, agent-athlete relations, intellectual property, governing bodies, and presentation of the athlete. Prerequisite: SPRT 205. F.

**SPRT 395. Special Topics in Sport Business. 1-3 Credits.**
Specific topics will vary. Provides opportunities for in-depth study beyond that of regularly scheduled courses. May be seminars, workshops, or lectures. Repeatable to a maximum of 6 credits. Prerequisite: SPRT 205. Repeatable to 6 credits. On demand.

**SPRT 397. Cooperative Education in Sport Business. 1-6 Credits.**
Substantive, compensated on-the-job experiential learning with a participating organization in a segment of the sport industry. Three credits of SPRT 397 or SPRT 497 are required in the Sport Business minor. Credits beyond the first three are elective credits. Repeatable to a maximum of 6 credits. Prerequisite: Approval of Sport Business Internship Coordinator. Repeatable to 6 credits. S/U grading. F,S,SS.

**SPRT 400. Sport Branding and Sponsorship. 3 Credits.**
Examining the influence of sport participants and spectators on the development of branding strategies and sponsorship relationships in the multi-faceted sports industry. Prerequisite: SPRT 205. S.

**SPRT 450. Facility and Event Planning. 3 Credits.**
Programs, functions, and procedures necessary to organize and develop sport facilities and events. Planning, design, and operation of sport facilities are investigated. Additionally, the multi-faceted nature of event development is examined in a variety of sport settings. Prerequisite: SPRT 205. S.

**SPRT 497. Internship in Sport Business. 1-6 Credits.**
Substantive on-the-job experiential learning with a participating organization in a segment of the sport industry. May or may not be compensated. Three credits of SPRT 397 or SPRT 497 are required in the Sport Business minor. Credits beyond the first three are elective credits. Repeatable to a maximum of 6 credits. Prerequisite: Approval of Sport Business Internship Coordinator. Repeatable to 6 credits. S/U grading. F,S,SS.

**Chemical Engineering (ChE)**

http://engineering.und.edu/chemical

Alishami, Bowman, Ji, Kolodka, Krishnamoorthy, Mann, Seames, and Tande (Chair)

The department’s primary objective is the education of undergraduate students so that, upon graduation, they are prepared to take challenging entry-level positions in a wide range of industries. These include not only traditional chemical and petroleum processing, but also fields such as biotechnology, consumer products, electronic materials, energy, food, polymers, pulp and paper, and environmental protection. They may be engaged in research, teaching, development, manufacturing, technical support, marketing, sales or project engineering, and frequently enter engineering management later in their careers. The prescribed curriculum provides a sound, technically based general education for those graduates who wish to pursue other professions such as...
**College of Engineering and Mines**  
**B.S. in Chemical Engineering**

Required 130 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts &amp; 221L and Fundamentals of Chemistry Laboratory *#</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>Arts/Humanities ES</td>
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<tr>
<td>Social Science ES</td>
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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>CHE 102</td>
</tr>
<tr>
<td>CHEM 254</td>
</tr>
<tr>
<td>MATH 166</td>
</tr>
<tr>
<td>PHYS 251</td>
</tr>
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<td>Arts/Humanities ES</td>
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| Credits | 17 |

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<td>ENGL 130</td>
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<tr>
<td>LEAD 101</td>
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<td>MATH 265</td>
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<td>PHYS 252</td>
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| Credits | 17 |

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CHE 206</td>
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<td>CHE 232</td>
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<tr>
<td>CHE 315</td>
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<td>MATH 266</td>
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| Credits | 16 |

<table>
<thead>
<tr>
<th>Junior Year</th>
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<tbody>
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<td>CHE 303</td>
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<tr>
<td>CHE 331</td>
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<tr>
<td>ENGR 206</td>
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| Technical Elective II | 3 |

| Credits | 16 |

<table>
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<td>CHE 332</td>
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<td>CHE 340</td>
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<tr>
<td>Material Science Elective</td>
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<td>Technical Elective I</td>
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| Credits | 17 |

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<tr>
<td>First Semester</td>
</tr>
<tr>
<td>CHE 408</td>
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<tr>
<td>CHE 411</td>
</tr>
</tbody>
</table>

* One of the main characteristics of this department, which distinguishes it from most other chemical engineering programs around the country, is the commitment to building a strong rapport between the students and faculty. We are able to maintain close interaction because of the relatively small class sizes (typically 30-35 students), and because all faculty members are committed to helping all students do their best and succeed. The interaction between faculty and students occurs formally in the classrooms and through the advising process, but it also frequently arises informally because all faculty maintain an open door policy. It all adds up to an environment that fosters mutual respect and maximizes learning. Our alumni report that the education they received at UND enables them to compete effectively with graduates from any other institution.

To allow qualified students to complete both undergraduate and graduate degrees in one year beyond that required to receive the baccalaureate degree alone, the department offers combined Bachelor of Science in Chemical Engineering (BSChE)/Master of Science (with a major in chemical engineering) and BSChE/Master of Engineering degrees. See Combined Degree Program under the College of Engineering and Mines (p. 618) section for additional details.
CHEM 470 | Thermodynamics & Kinetics  | 3
Advanced Chem. Science Elective | 3

**Credits** | 16

### Second Semester

**CHE 412** | Plant Design II: Process Project Engineering | 5
**CHE 416** | Chemical Product Design | 3
**Arts/Humanities ES** | 3
**Advanced Chem. Science Elective** | 3

**Credits** | 14

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# CHEM 121 General Chemistry I/CHM 121L General Chemistry I Laboratory may be taken in lieu of CHEM 221 Fundamentals of Chemistry - Concepts/CHM 221L Fundamentals of Chemistry Laboratory and CHEM 122 General Chemistry II/CHM 122L General Chemistry II Laboratory may be taken in lieu of CHEM 254 Inorganic Chemistry I/CHM 254L Inorganic Chemistry I Laboratory.
* Must be completed with a grade of C or better prior to enrollment in Junior-level ChE courses.
** Must be completed at UND.
†† CHE 235 Chemical Engineering Summer Laboratory I and CHE 335 Chemical Engineering Summer Laboratory II may be taken in lieu of the CHE 232 Chemical Engineering Laboratory I, CHE 331 Chemical Engineering Laboratory II, CHE 332 Chemical Engineering Laboratory III sequence.
† CHE 413/CHE 414 may be taken in lieu of CHE 412.

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## Concentration in Energetics

Energetics concepts are widely used in defense applications, as well as many other areas including space exploration, counter-terrorism, fire suppression and public safety technologies, automotive airbags, and fireworks. With defense and security representing important issues facing our nation today, there is a critical need to grow and optimize the research and development of energetic materials. Furthermore, it has become equally important to train replacements for the aging workforce in this important technological area. This program is designed to equip students for careers associated with energetic materials, conduct research and development activities, or to pursue advanced studies in technologies that will meet the demands of the space and defense industries in the future.

To qualify for a Concentration in Energetics, a student must complete the requirements for the B.S. in Chemical Engineering. Requirements for the concentration are fulfilled by taking the following courses to meet the required electives of the B.S. ChE degree. In addition, one additional credit is required for the concentration: CHE 420 Capstone in Sustainable Energy.

**Credits** | 130

### Concentration in Sustainability

Climate change, rising energy costs, and water-energy-food security represent some of the most significant issues facing today’s society. It will take major advances in technology to help resolve these issues. Additionally, energy-related issues have created a new industry with a strong need for the training and development of human capital. The concentration in Sustainability is designed to help students prepare themselves for careers associated with sustainability and sustainable energy technologies.

To qualify for a concentration in Sustainability, a student must complete the requirements for the B.S. in Chemical Engineering. Requirements for the concentration are fulfilled by taking the following courses to meet the required electives of the B.S. ChE degree. In addition, one additional credit is required for the concentration: CHE 420 Capstone in Sustainable Energy.

**Credits** | 16

### Concentration in Petroleum Engineering

This program is designed to equip students for careers in Petroleum Engineering with an emphasis on the upstream development, drilling and production of oil and natural gas. Students will also be prepared to conduct research and development activities or to pursue advanced studies in technologies that will meet the demands of upstream oil production.
To qualify for a Concentration in Petroleum Engineering, a student must complete the requirements for the B.S. in Chemical Engineering. Requirements for the concentration are fulfilled by taking the following courses to meet the required electives of the B.S. CHE degree. In addition, one additional credit is required for the concentration: CHE 424: Capstone in Petroleum Engineering.

<table>
<thead>
<tr>
<th>Technical Elective II</th>
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</thead>
<tbody>
<tr>
<td>PTRE 411 Drilling Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective I</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 421 Production Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Chemical Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 431 Reservoir Engineering</td>
<td>3</td>
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<tr>
<td>Select one of the following (Advanced Chemical Science Elective)</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 311 Petroleum Fluid Properties</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 407 Petroleum Geology</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 461 Natural Gas Engineering</td>
<td>3</td>
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<tr>
<td>Select one of the following (Business/Entrepreneurship Elective)</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 441 Petroleum Evaluation &amp; Management</td>
<td>3</td>
</tr>
<tr>
<td>CE 444 Contracts and Specifications</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 405 Petroleum Eng. Economy and Law</td>
<td>3</td>
</tr>
<tr>
<td>Capstone: CHE 424 Capstone in Petroleum Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

The student’s transcript will be marked by a Concentration in Petroleum Engineering upon completion of the recommended curriculum.

### Courses

**CHE 102. Introduction to Chemical Engineering. 2 Credits.**
An introduction to the chemical engineering profession. Also includes introduction to dimension analysis, material balances, unit operations, safety and engineering economics. S.

**CHE 201. Chemical Engineering Fundamentals. 3 Credits.**
Introductory principles of stoichiometry with emphasis directed to material and energy balances involved in chemical processes. Prerequisite: CHEM 122 or CHEM 254. F.

**CHE 206. Unit Operations in Chemical Engineering. 3 Credits.**
Application of the principles of momentum and heat transfer from a unit operations perspective. Prerequisites: CHE 201, CEM majors only or permission of instructor. S.

**CHE 232. Chemical Engineering Laboratory I. 2 Credits.**
The use and application of apparatus to measure the physical and chemical properties involved in chemical process material and energy balances. Prerequisite: CEM majors only or permission of instructor. Prerequisite or Corequisite: CHE 201. S.

**CHE 235. Chemical Engineering Summer Laboratory I. 3 Credits.**
The use and application of apparatus to measure the physical and chemical properties involved in chemical process material and energy balances and fluid flow. Prerequisites: CHE 201, CHE 206 and CHE 315; CEM majors only or permission of instructor. SS.

**CHE 301. Introduction to Transport Phenomena. 4 Credits.**
An analytical study of the transport of momentum, energy and mass; derivation and utilization of the differential equations of change. Prerequisites: CHE 201 with a grade of C or better; Chemical Engineering majors only or permission of instructor. Prerequisite or Corequisite: MATH 266. F.

**CHE 303. Chemical Engineering Thermodynamics. 4 Credits.**
Thermodynamics applied to chemical engineering with emphasis on computational work, including thermodynamic laws, chemical equilibria and pressure-volume-temperature relationships. Prerequisites: CHE 201 with a grade of C or better; Chemical Engineering majors only or permission of instructor. F.

**CHE 305. Separations. 3 Credits.**
Theory and application of rate-based and equilibrium-staged separations. Prerequisites: CHE 303 and CHE 201 with a grade of C or better; Chemical Engineering majors only or permission of instructor. Prerequisite or Corequisite: CHE 206. S.

**CHE 315. Engineering Statistics and Design of Experiments. 3 Credits.**
Statistical background needed to plan, conduct, and analyze engineering experiments. Topics include propagation of error, confidence intervals, hypothesis testing, linear regression, analysis of variance, and an introduction to statistical design of experiments. Prerequisite: Chemical Engineering majors only or permission of instructor. Prerequisite or Corequisite: MATH 266. S.

**CHE 321. Chemical Engineering Reactor Design. 3 Credits.**
Theory of chemical reaction rates. Design of batch, tubular, CSTR and catalytic chemical reactors. Prerequisites: CHE 206, MATH 266 and C or better in CHE 201; Chemical Engineering majors only or permission of instructor. S.

**CHE 331. Chemical Engineering Laboratory II. 2 Credits.**
Experiments illustrating physico-chemical principles and the application of fluid flow and heat transfer theory. Prerequisites: CHE 315, CHE 206, and C or better in CHE 201; Chemical Engineering majors only or permission of instructor. F.

**CHE 332. Chemical Engineering Laboratory III. 2 Credits.**
Experiments reinforcing physico-chemical principles, unit operations, and separations. Pre-design labs are also introduced. Prerequisites: CHE 331; Chemical Engineering majors only or permission of instructor. S.

**CHE 335. Chemical Engineering Summer Laboratory II. 3 Credits.**
Experiments reinforcing physico-chemical principles, unit operations, separations, and mass and energy balances. Pre-design labs are also introduced. Prerequisites: CHE 201, CHE 206, CHE 315 and either CHE 232 or CHE 235; Chemical Engineering majors only or permission of instructor. SS.

**CHE 340. Professional Integrity in Engineering. 3 Credits.**
This course emphasizes the need for technical professionals to develop personal integrity and moral character in order to benefit society. Students will develop an appreciation for the global context of their decisions, the ability to make sound ethical decisions, and communicate their ideas effectively. This course also explores the impact of engineering and applied science on society. S.

**CHE 380. Service Learning. 1-3 Credits.**
Design and implementation of engineering-related projects to serve the community, including K-12 STEM outreach. Hands-on design experience by the student working as an individual or part of a team. Repeatable to 9 credits. S/U grading. F.S.

**CHE 381. Experiential Learning. 1-3 Credits.**
Hands-on design experience by student teams. May include interdisciplinary work on engineering student design competitions. Repeatable to 9 credits. S/U grading. F.S.

**CHE 397. Cooperative Education. 1-2 Credits.**
A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. Prerequisite: Sophomore standing in the chemical engineering degree program; Cumulative GPA of 2.0 or higher. Repeatable to 12 credits. S/U grading. S.F.S.S.

**CHE 404. Air Emissions: Regulation and Control. 3 Credits.**
This course is designed to enable engineers to understand natural and anthropogenic sources of air pollution, their impact on health and the environment, and learn ways to minimize air emissions by application of control practices. F.

**CHE 408. Process Dynamics and Control. 3 Credits.**
Dynamics and control of chemical processes and of systems. Prerequisites: MATH 266, CHE 206, and CHE 305; Chemical Engineering majors only or permission of instructor. F.

**CHE 411. Plant Design I: Process Design and Economics. 4 Credits.**
Introduction to how projects are executed in the process industries, including an understanding of what constitutes preliminary process design, preliminary cost estimation, the fundamentals of economics as applied to process economic assessment, sustainability considerations in design, oral written communications, teamwork, and the typical drawings and other deliverables produced during the scoping phase of process plant design. There is a particular emphasis on safety considerations in design. Prerequisites: CHE 303 and C or better in CHE 201, CHE 206, CHE 305 and CHE 321; Chemical Engineering majors only or permission of instructor. F.
CHE 412. Plant Design II: Process Project Engineering. 5 Credits.
Proficiency is gained in the development of the preliminary design for a major chemical process. In addition, this course provides an introduction to the second stage of process design—the conceptual design process, including an introduction to Piping and Instrument-level design development, process control design and facility layout. A variety of oral communications skills are included. Prerequisites: CHE 408 and C or better in CHE 411; Chemical Engineering majors only or permission of instructor. S.

CHE 413. Plant Design II: Preliminary Process Project Engineering. 3 Credits.
Proficiency is gained in the development of the preliminary design for a major chemical process. A variety of oral communication skills are included. Prerequisites: CHE 411 with a C or better and CHE 408; Chemical Engineering majors only or permission of instructor. S.

CHE 414. Plant Design II: Conceptual Process Project Engineering. 2 Credits.
This course provides an introduction to the second stage of process design—conceptual design. Student will complete process-related components of a conceptual design for a major chemical process including Piping and Instrument Diagrams and Plant Layout Diagrams. A variety of oral communication skills are included. Prerequisites: CHE 413; Chemical Engineering majors only or permission of instructor. SS.

CHE 416. Chemical Product Design. 3 Credits.
Introduction to the design of chemical products. Topics include product development processes and methodologies, including StageGate and Design for Six Sigma (DFSS). Course contains both classroom and lab activities. Prerequisites: CHE 411, CHEM 340 and CHEM 340L or CHEM 341 and CHEM 341L; Chemical Engineering majors only or permission of instructor. S.

CHE 420. Capstone in Sustainable Energy. 1 Credit.
The student will work one-on-one with a faculty member to develop a concept paper on the primary issues facing the development and implementation of sustainable energy technologies. Prerequisite: Completion of 12 credit hours towards a Concentration in Sustainable Energy. S.

CHE 422. Capstone in Energetics. 1 Credit.
The student will work with a faculty mentor to develop a white paper on a major issue facing the development and implementation of energetics technologies. This will include a discussion of the technical, economic, political, and social barriers facing implementation of the selected technology(s) plus plausible methodologies of overcoming these barriers. Prerequisite: Completion of, or concurrent enrollment in, 12 credit hours towards a Concentration in Energetics. S.

CHE 424. Capstone in Petroleum Engineering. 1 Credit.
The student will work with a faculty mentor to develop a white paper on a major issue facing the development and implementation of petroleum engineering technologies. This will include a discussion of the technical, economic, political, and social barriers facing implementation of the selected technology(s) plus plausible methodologies of overcoming these barriers. Prerequisites: Completion of, or concurrent enrollment in, 12 credit hours towards a Concentration in Petroleum Engineering; restricted to Chemical Engineering majors. S/U grading. S.

CHE 431. Chemical Engineering Laboratory IV. 3 Credits.
Laboratory study of the unit operations of Chemical Engineering. Prerequisites: CHE 305 and either CHE 332 or CHE 335; Chemical Engineering majors only or permission of instructor. F,SS.

CHE 435. Materials and Corrosion. 3 Credits.
Provides an introduction to the fundamental properties of metals and polymers, reviews the forms of metal corrosion and of polymer degradations. S.

CHE 480. Undergraduate Research. 1-6 Credits.
Undergraduate research experience in chemical engineering under the guidance of a faculty member. Prerequisite: Consent of instructor. Repeatable to 12 credits. S/U grading. F,SS.

CHE 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F,SS.

CHE 493A. Special Topics. 1-3 Credits.
Special topics dictated by student request and current faculty interest. The particular course may be initiated by the students by contacting members of the faculty. Regular grading. Repeatable to 9 credits. Repeatable to 9 credits. On demand.

CHE 493B. Special Topics. 1-3 Credits.
Special topics dictated by student request and current faculty interest. The particular course may be initiated by the students by contacting members of the faculty. S/U grading. Repeatable to 9 credits. Prerequisite: Consent of instructor. Repeatable to 9 credits. S/U grading. On demand.

Chemistry (Chem)

http://www.arts-sciences.und.edu/chemistry

Abrahamson, H. (Chair), Abrahamson, J., Chu, Delhommelle, Du, Hofmann, Kozlak, Kubatova, Mattingly, Piere, Smoliatkov, Stahl, Thomasson, Whitney and Zhao

The Chemistry Department’s Bachelor of Science (B.S.) in Chemistry program has been approved by the Committee on Professional Training of the American Chemical Society (ACS). This means that the teaching staff, curriculum, equipment, library, and other facilities of the Department meet the standards established by the Society for the proper undergraduate training of chemists. Students who complete the work for the professional degree, Bachelor of Science in Chemistry, will receive a special certificate from the Society upon graduation and certification by the chairman of the department. Chemistry graduates are eligible to become full members of the ACS.

Students who wish to have the best preparation for graduate work or for an industrial position in chemistry should follow the program leading to the Bachelor of Science in Chemistry. Students who desire a course of study which is less concentrated in chemistry, in order to prepare themselves for advanced work in other fields, should pursue the program leading to the B.S. degree with a major in chemistry. Those students who wish to prepare themselves for teaching in High School may pursue the program leading to the B.S. degree with a major in chemistry in the College of Arts and Sciences and take additional courses in the Department of Teaching and Learning to qualify for teaching certification. The specific course requirements for each of these major programs are listed below.

Graduate Study

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with majors in inorganic chemistry, organic chemistry, physical chemistry and analytical chemistry. In order to pursue graduate work in chemistry, the student must have the baccalaureate degree with a major in chemistry.

College of Arts and Sciences

Teacher Certification

In addition to fulfilling the requirements of one of the majors listed above, students seeking secondary teacher certification in Chemistry must complete the Department of Teaching and Learning (p. 241) requirements in Secondary Education. Students seeking certification must also complete these additional courses:

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<td>BIOL 150</td>
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<td>&amp; BIOL 151</td>
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<td>&amp; 121L</td>
<td>&amp; Global Physical Environment Laboratory</td>
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</table>

Total Credits: 15

Chemistry majors seeking secondary certification must have an adviser both in the Chemistry Department and in the Department of Teaching and Learning. Formal admission to Teacher Education is normally sought while enrolled in T&L 250 Introduction to Education (see Department of Teaching and Learning (p. 241) listing).
Medical Laboratory Science

The Medical Laboratory Science (MLS) program at UND offers a "4+1" curriculum that allows a student to receive a certificate from the MLS program with one year of additional study past a B.S. degree in Chemistry. Students would then be eligible to take a national certification examination to become a certified Medical Laboratory Scientist. The MLS program requires a cumulative GPA of at least 2.8 for the B.S. program and a grade of C or better in certain specified courses. Please see the MLS (p. 186) program for more details.

B.S. with Major in Chemistry (p. 186)

College of Arts and Sciences

B.S. in Chemistry (ACS Certified Program)

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings).

II. The Following Curriculum:

Major Requirements—51 hours of Chemistry including:

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<tr>
<th>Freshman Year</th>
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<td>Calculus I 1</td>
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<tr>
<td>MATH 166</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<tr>
<th>Sophomore Year</th>
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<tbody>
<tr>
<td>CHEM 333</td>
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<td>CHEM 341</td>
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<td>CHEM 361</td>
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<tr>
<td>PHYS 251</td>
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<tr>
<td>MATH 265</td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>CHEM 342</td>
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<tr>
<td>CHEM 362</td>
</tr>
<tr>
<td>PHYS 252</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>CHEM 454</td>
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<tr>
<td>CHEM 466</td>
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<tr>
<td>CHEM 443</td>
</tr>
<tr>
<td>First Semester of a Foreign Language</td>
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</table>

| Second Semester of a Foreign Language | 4       |

| Essential Studies and Other Electives 2,4 | 2       |
| Credits                                  | 16      |

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<th>Senior Year</th>
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<tbody>
<tr>
<td>CHEM 455</td>
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<td>CHEM 462</td>
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<tr>
<td>Essential Studies and Other Electives 2,4</td>
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<td>Credits</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>CHEM 442</td>
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<tr>
<td>CHEM 488</td>
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<td>CHEM 492</td>
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<tr>
<td>Essential Studies and Other Electives</td>
</tr>
<tr>
<td>Credits</td>
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</tbody>
</table>

Total Credits 125

1 If a student is not ready for MATH 165 Calculus I, the math sequence may be moved back one semester and MATH 107 Precalculus (also MATH 103 College Algebra, if needed) should be taken in the first semester.

2 Suggested electives are courses in Physics, Mathematics, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.

3 Chem 44X (CHEM 441 Instrumental Analysis I - Spectroscopy, CHEM 442 Instrumental Analysis II - Electrochemistry and CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry) courses are offered within a regular, two-year cycle. Students can take Chem 44X courses in any order.

4 Other undergraduate and graduate level courses in Chemistry may be taken as electives.

5 Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.

6 Chem 492, Senior Research, is the Chemistry capstone course (3 credits). If the student has another major, a non-chemistry capstone course may be taken. If so, the student must take 1 credit of either Chem 392, Special Problems in Chemistry, or Chem 492, Senior Research.

B.S. with Major in Chemistry

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings)

II. The Following Curriculum:

Major Requirements — 43 hours (Option A) or 40 hours (Option B) of Chemistry and Biochemistry including:

Option A. Physical Science Emphasis

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 101</td>
<td>Orientation to Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I 1</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>CHEM 441</td>
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<tr>
<td>CHEM 471</td>
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<tr>
<td>CHEM 471R</td>
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<tr>
<td>BMB 301</td>
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<td>Essential Studies and Other Electives</td>
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<tbody>
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<td>CHEM 455</td>
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<tr>
<td>CHEM 462</td>
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<tr>
<td>Essential Studies and Other Electives 2,4</td>
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<tr>
<td>Credits</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
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<td>CHEM 442</td>
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<td>Essential Studies and Other Electives</td>
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<tr>
<td>Credits</td>
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</tbody>
</table>

Total Credits 125

1 If a student is not ready for MATH 165 Calculus I, the math sequence may be moved back one semester and MATH 107 Precalculus (also MATH 103 College Algebra, if needed) should be taken in the first semester.

2 Suggested electives are courses in Physics, Mathematics, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.

3 Chem 44X (CHEM 441 Instrumental Analysis I - Spectroscopy, CHEM 442 Instrumental Analysis II - Electrochemistry and CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry) courses are offered within a regular, two-year cycle. Students can take Chem 44X courses in any order.

4 Other undergraduate and graduate level courses in Chemistry may be taken as electives.

5 Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.

6 Chem 492, Senior Research, is the Chemistry capstone course (3 credits). If the student has another major, a non-chemistry capstone course may be taken. If so, the student must take 1 credit of either Chem 392, Special Problems in Chemistry, or Chem 492, Senior Research.
Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Computer Science, Chemical Engineering, Business Management, and Speech.

Chem 44X (CHEM 441 Instrumental Analysis I - Spectroscopy, CHEM 442 Instrumental Analysis II - Electrochemistry and CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry) courses are offered within a regular, two-year cycle. Students can take Chem 44X courses in any order.

Other undergraduate and graduate level courses in Chemistry may be taken as electives.

Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.

Chem 492 is the Chemistry Capstone, Senior Research (3 credits). If the student has another major, a non-chemistry capstone course may be selected. If so, the student must take 1 credit of either Chem 392, Special Problems in Chemistry, or Chem 492, Senior Research.

Option B. Biochemistry Emphasis

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 101 Orientation to Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 121 General Chemistry I &amp; 121L and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150 General Biology I &amp; 150L and General Biology I Laboratory</td>
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</tr>
<tr>
<td>Essential Studies Electives</td>
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</tr>
<tr>
<td>Credits</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 122 General Chemistry II &amp; 122L and General Chemistry II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>MATH 146 Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 151 General Biology II &amp; 151L and General Biology II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<td>Credits</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 333 Analytical Chemistry &amp; 333L and Analytical Chemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 341 Organic Chemistry I &amp; 341L and Organic Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 361 Problem Solving in Organic Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 251 University Physics I</td>
<td>4</td>
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<tr>
<td>MATH 265 Calculus III</td>
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<tr>
<td>Credits</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>CHEM 441 Instrumental Analysis I - Spectroscopy</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 471 Quantum Mechanics &amp; Spectroscopy</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 471R Quantum Mechanics &amp; Spectroscopy Recitation</td>
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</tr>
<tr>
<td>Second Semester of a Foreign Language</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<thead>
<tr>
<th>Junior Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 462 Physical Chemistry Laboratory</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<tbody>
<tr>
<td>CHEM 442 Instrumental Analysis II - Electrochemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 492 Senior Research</td>
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<td>Essential Studies and Other Electives</td>
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<tr>
<td>Credits</td>
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</table>

Total Credits 125

1. If a student is not ready for MATH 165 Calculus I, the math sequence may be moved back one semester and MATH 107 Precalculus (also MATH 103 College Algebra, if needed) should be taken in the first semester.

2. Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Computer Science, Chemical Engineering, Business Management, and Speech.
Senior Year

First Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 467</td>
<td>Survey of Physical Chemistry Laboratory</td>
<td>2</td>
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<tr>
<td>BMB 401</td>
<td>Biochemistry of Proteins and Information Flow</td>
<td>3</td>
</tr>
<tr>
<td>BMB 403</td>
<td>Advanced Biochemistry Laboratory</td>
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Total Credits: 15

Second Semester

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CHEM 492</td>
<td>Senior Research</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies and Other Electives</td>
<td>12</td>
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</tr>
</tbody>
</table>

Total Credits: 15

1 If a student is not ready for MATH 146 Applied Calculus I, MATH 103 College Algebra should be taken in the first semester. If a student would like the option to change into the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis on the Physical Science Option at a later date, be aware that MATH 165 Calculus I, MATH 166 Calculus II, and MATH 265 Calculus III are required. If a student who begins either the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option wishes to change into the Biochemistry Option, MATH 165 Calculus I will substitute for MATH 146 Applied Calculus I.

2 BIOL 150 General Biology I and BIOL 151 General Biology II can be taken in the sophomore year. They are prerequisites to other required biology courses.

3 Electives must include 3 credit hours from BIOL 341 Cell Biology, BIOL 315 Genetics, or MBIO 302 General Microbiology Lecture/MBio 302L General Microbiology Laboratory. Other suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech. Other undergraduate and graduate level courses in Chemistry may also be taken as electives.

4 Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.

5 CHEM 492, Senior Research, is the Chemistry Capstone course (3 credits). If the student has another major, a non-chemistry Capstone course may be selected. If so, the student must take 1 credit of either CHEM 392, Special Problems in Chemistry, or CHEM 392, Senior Research.

Minor in Chemistry

Required: A minimum of 20 semester hours unless all twenty are required for the student’s current major. The 20 semester hours shall include one year of general/inorganic chemistry with laboratory, a seminar of analytical chemistry with laboratory, and one year of organic chemistry with laboratory. CHEM 340 Survey of Organic Chemistry and BMB 301 Biochemistry can be substituted for one year of organic chemistry. If all twenty hours are required by the student’s major, a minor may be achieved by taking 2 semester hours at or above the 300 level beyond the chemistry courses required for the major.

Courses

**CHEM 101. Orientation to Chemistry. 1 Credit.**

This seminar course will introduce 1st year students pursuing either a BS in Chemistry or BS in Chemistry degree, and provide acquaintance with relevant UND learning resources. Students will have the opportunity to meet faculty and senior undergraduate and graduate students providing exposure to research in chemistry, exploring what it means to perform scientific research. Prerequisite or Corequisite: CHEM 121 or CHEM 221. F.

**CHEM 110. Survey of Chemistry. 4 Credits.**

A course designed specifically for non-science majors who wish to obtain a basic understanding of chemistry as applied in the world today. Does not serve as a prerequisite for any other chemistry course. Includes laboratory. F.S.

**CHEM 115. Introductory Chemistry. 3 Credits.**

Measurement, ionic and covalent compounds, chemical calculations, states of matter; energy, solutions, reactions, chemical bonding. F.S.

**CHEM 115L. Introductory Chemistry Laboratory. 1 Credit.**

Laboratory to accompany CHEM 115. Corequisite: CHEM 115. F.S.

**CHEM 116. Introduction to Organic and Biochemistry. 3 Credits.**

Does not satisfy the prerequisite for any advanced chemistry course. A second semester of general chemistry with emphasis on organic and biochemistry. Includes alkanes, alkenes, alkynes, aromatics, alcohol, phenols, ethers, aldehydes, ketones, carboxylic acids, esters, amines, amides, carbohydrates, lipids, amino acids, proteins, and nucleic acids. Required of students in the B.S. in Chemistry program. Prerequisites: CHEM 115 and CHEM 115L, or CHEM 121 and CHEM 121L; a minimum of a C in either course is required. F.S.

**CHEM 116L. Introduction to Organic and Biochemistry Laboratory. 1 Credit.**

Laboratory to accompany CHEM 116. Prerequisites: CHEM 115 and CHEM 115L, or CHEM 121 and CHEM 121L. Corequisite: CHEM 116. F.S.

**CHEM 121. General Chemistry I. 3 Credits.**

Open to all students; no high school credit in chemistry required. Elementary principles and theories of chemistry; matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, gases. Prerequisite or Corequisite: MATH 103 or higher. F.S.S.

**CHEM 121L. General Chemistry Laboratory. 1 Credit.**

Laboratory to accompany CHEM 121. Prerequisite or Corequisite: CHEM 121. F.S.S.

**CHEM 122. General Chemistry II. 3 Credits.**

Elementary principles and theories of chemistry: Intermolecular forces, liquids, solids, kinetics, equilibria, acids and bases. Solution of chemistry, precipitation, thermodynamics, electrochemistry. Prerequisite: CHEM 121 with a grade of C or better and CHEM 121L. F.S.S.

**CHEM 122L. General Chemistry Laboratory II. 1 Credit.**

Laboratory to accompany CHEM 122. Prerequisite: CHEM 121 and CHEM 121L. Corequisite: CHEM 122. F.S.S.

**CHEM 221. Fundamentals of Chemistry - Concepts. 3 Credits.**

Atomic and molecular structure, stoichiometry, states of matter, thermodynamics, periodicity and descriptive inorganic chemistry. Prerequisite: High school chemistry. Corequisite: CHEM 221L. Prerequisite or Corequisite: MATH 165. F.

**CHEM 221L. Fundamentals of Chemistry Laboratory. 1 Credit.**

Laboratory to accompany CHEM 221. Prerequisites: High school chemistry and MATH 103 or appropriate Math Placement score. Corequisite: CHEM 221. F.

**CHEM 254. Inorganic Chemistry I. 3 Credits.**

Required for chemistry majors. Chemistry of the elements with emphasis on occurrence, preparation, physical properties, chemical reactivity, uses, nomenclature, structure, and periodic behavior. Includes chemical kinetics and thermodynamics. Prerequisite: CHEM 122 or CHEM 221. Corequisite: CHEM 254L. S.

**CHEM 254L Inorganic Chemistry Laboratory I. 1 Credit.**

Qualitative and quantitative inorganic chemistry, including precipitation, acid-base reactions, and redox reactions in aqueous solutions. The preparation and isolation of main-group element and transition metal compounds. The characterization of these compounds with standard chemical and instrumental methods. Determinations of the rates of chemical reactions and of bond parameters. Prerequisite: CHEM 122 or CHEM 221. Corequisite: CHEM 254L. S.

**CHEM 333. Analytical Chemistry. 3 Credits.**

For all science majors interested in using analytical chemistry techniques in a modern science laboratory. Principles of quantitative and qualitative chemical analysis as applied to environmental, clinical and forensic science are covered. Prerequisite: CHEM 122 or CHEM 221. Corequisite: CHEM 333L. F.S.

**CHEM 333L. Analytical Chemistry Laboratory. 1 Credit.**

Laboratory to accompany CHEM 333. Principles of quantitative and qualitative chemical analysis as applied to environmental, clinical and forensic science are covered. Prerequisite: CHEM 122 or CHEM 254. Corequisite: CHEM 333. F.S.

**CHEM 340. Survey of Organic Chemistry. 4 Credits.**

For all students interested in a one-semester survey of organic chemistry. Structure and bonding, nomenclature; hydrocarbons: alkanes, alkenes, alkynes, aromatics; substituted hydrocarbons: alkyl halides, stereochemistry, alcohols, phenols, ethers, amines; carboxyls: aldehydes, ketones; carboxylic acids, esters, amides. Prerequisites: CHEM 122 with a grade of C or better and CHEM 121L, or CHEM 254 and CHEM 254L. Corequisite: CHEM 340L. S.
CHEM 340L. Survey of Organic Chemistry Laboratory. 1 Credit.
Laboratory to accompany CHEM 340. Prerequisite: CHEM 122L or
CHEM 254L. Corequisite: CHEM 340. S.

CHEM 341. Organic Chemistry I. 3 Credits.
Designed for science and pre-professional students. Structure and bonding,
acid-base reactions, nomenclature, stereochemistry, functional groups,
alkanes, alkenes, alkynes, alky halides and alcohols. Applications of
spectrometric methods (NMR, IR and MS) for identification of organic
compounds. Prerequisites: CHEM 122 with a grade of C or better and
CHEM 122L; or CHEM 254 and CHEM 254L. Corequisite: CHEM 341L. F,S.

CHEM 341L. Organic Chemistry I Laboratory. 1 Credit.
Laboratory to accompany CHEM 341. Required for chemistry majors.
Prerequisite: CHEM 122L or CHEM 254L. Prerequisite or Corequisite:
CHEM 341. F,S.

CHEM 342. Organic Chemistry II. 3 Credits.
Designed for science and pre-professional students. Structure and reactivity,
organometallic compounds, aldehydes, ketones, carboxylic acids and their
derivatives, aromatic compounds, amines, multi-step synthesis. Prerequisite:
CHEM 341 or CHEM 341C with a grade of C or better and CHEM 341L.
Prerequisite or Corequisite: CHEM 342L. F,S.

CHEM 342L. Organic Chemistry II Laboratory. 1 Credit.
Required for all chemistry majors. Laboratory to accompany CHEM 342.
Prerequisite: CHEM 341. Prerequisite or Corequisite: CHEM 342. F,S.

CHEM 361. Problem Solving in Organic Chemistry I. 1 Credit.
Reaction mechanisms and multi-step syntheses based on the reactions of
alkenes, alkenes, alkyl halides and alcohols. Prerequisites: CHEM 122, with
a grade of C or better and CHEM 122L or CHEM 254 and CHEM 254L.
Prerequisites or Corequisites: CHEM 341 and CHEM 341L. F,S.

CHEM 362. Problem Solving in Organic Chemistry II. 1 Credit.
Reaction mechanisms and multi-step syntheses involving organometallic
compounds, aldehydes, ketones, carboxylic acids and their derivatives,
aromatic compounds and amines. Prerequisites: CHEM 341 with a grade of
C or better, CHEM 341L, and CHEM 361. Corequisites: CHEM 342 and
CHEM 342L. F,S.

CHEM 392. Special Problems in Chemistry. 1-3 Credits.
An opportunity for students to be involved in research, teaching, and outreach
activities under close faculty guidance. Prerequisite: Consent of Instructor.
Repeatable to 6 credits. S/U grading. F,S.

CHEM 397. Cooperative Education. 1-2 Credits.
May be repeated for a maximum of 6 credits. Prerequisites: One year of
freshman chemistry with laboratory and either one of the following course
sequences: (CHEM 341, CHEM 342) or (CHEM 341, BMB 301). Repeatable to
6 credits. S/U grading. F,S,SS.

CHEM 431. Selected Topics in Chemistry. 1-5 Credits.
Repeatable with different topics. Repeatable. On demand.

CHEM 441. Instrumental Analysis I - Spectroscopy. 2 Credits.
Topics ranging from the fundamentals of spectroscopic analysis to
contemporary techniques (including atomic absorption spectroscopy,
atomic emission spectroscopy, atomic fluorescence spectroscopy, UV-vis
molecular spectroscopy, fluorescence molecular spectroscopy, and infrared
spectroscopy) are explored in the classroom and in laboratory exercises.
Prerequisites: CHEM 333 and CHEM 333L. S, even years.

CHEM 442. Instrumental Analysis II - Electrochemistry. 2 Credits.
Topics ranging from the fundamentals of electrochemistry (including
thermodynamics, kinetics, and mass transfer) to contemporary techniques
of electroanalysis (such as potentiometry, coulometry, amperometry,
and voltammetry) are explored in classroom and laboratory exercises.
Prerequisites: CHEM 333 and CHEM 333L. S, odd years.

CHEM 443. Instrumental Analysis III - Chromatography/Mass
Spectrometry. 2 Credits.
Topics involving the fundamentals of gas and liquid chromatography (GC and
LC) and mass spectrometry (MS) as well as their practical considerations in
the method development (including sample preparation and MS interpretation)
are covered. The modern chromatographic techniques (GC, GC/MS, and
high resolution MS) are explored in classroom and laboratory exercises.
Prerequisites: CHEM 333 and CHEM 333L. F, odd years.

CHEM 454. Inorganic Chemistry II. 3 Credits.
Chemistry of inorganic compounds in terms of modern theories and concepts.
Prerequisites: CHEM 254 and CHEM 342. Corequisites: CHEM 454L. F.

CHEM 454L. Inorganic Chemistry II Laboratory. 1 Credit.
A course in laboratory techniques as applied to inorganic systems, including
modern methods for synthesizing inorganic compounds and their analyses
by spectrometric and diffraction techniques. Prerequisites: CHEM 254 and
CHEM 254L. Corequisite: CHEM 454. F.

CHEM 455. Spectroscopy and Structure. 3 Credits.
Applications of spectroscopic techniques to the determination of molecular
structure. Prerequisite: CHEM 342 or CHEM 466. F.

CHEM 462. Physical Chemistry Laboratory. 3 Credits.
Required for B.S. in Chemistry and B.S. with Major in Chemistry Physical
Science Emphasis majors. The solution of chemical problems in the laboratory
using modern physical and analytical methods. Prerequisites: CHEM 466.
Prerequisite or Corequisite: CHEM 471. S.

CHEM 463. Advanced Synthesis Laboratory. 3 Credits.
Advanced synthetic, separatory and characterization methods currently used
in modern laboratory practice will be emphasized. Prerequisites: CHEM 462 or
CHEM 467, and CHEM 455. S.

CHEM 466. Fundamentals of Physical and Biophysical Chemistry. 4
Credits.
Prerequisites or Corequisites: CHEM 462 or CHEM 467, with a Major in
Chemistry degree. Survey of topics in physical and biophysical
chemistry with an emphasis for the life sciences. Topics include chemical
thermodynamics, kinetics, introductory quantum mechanics, and
spectroscopy.
Prerequisites: CHEM 340 or CHEM 342, MATH 146 or MATH 165, and
PHYS 212 or PHYS 252. F.

CHEM 471. Quantum Mechanics & Spectroscopy. 3 Credits.
Theory and nature of bonding and structure, spectroscopy, and optics.
Prerequisites: CHEM 466, MATH 265, and PHYS 252. S.

CHEM 471R. Quantum Mechanics & Spectroscopy Recitation. 1 Credit.
CHEM 471R is the Recitation/Discussion section of CHEM 471 to help students
in developing essential skills in connecting Calculus, Physics and Chemistry.
Prerequisites: CHEM 466, MATH 265, and PHYS 252. Corequisite: CHEM 471.
S.

CHEM 475. Materials Chemistry. 3 Credits.
Thermodynamics and kinetics, material chemistry, preparation methods and
case studies in materials science. Prerequisites: CHEM 466 or PHYS 252,
MATH 165. F.

CHEM 488. Undergraduate Seminar. 1 Credit.
Required for B.S. in Chemistry. Introduction to current research in chemistry
and to professional chemistry seminar preparation. Corequisite: CHEM 492 or
CHEM 463. S.

CHEM 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits.
Repeatable to 9 credits.

CHEM 492. Senior Research. 1-3 Credits.
An opportunity for advanced students to work on research problems under
close faculty guidance. Submission of a comprehensive final report is part
of the course requirements. This course may be used as a capstone course
in chemistry for 3 credits. May be repeated up to 6 credits. Prerequisite:
CHEM 342. Corequisite: CHEM 462 or CHEM 467. Repeatable to 6 credits.
F,S,SS.

Civil Engineering (CE)

http://www.engineering.und.edu/civil

Dockter, Gedafa, Jerath (Chair), Lim, Mamaghani, Suleiman and Xiao

The mission of the civil engineering program at the University of North
Dakota is to provide students with a well-rounded civil engineering education.
Graduates of the program will be prepared to function effectively in a wide
range of professional settings such as engineering consulting firms, industries
and governmental agencies. The civil engineering program emphasizes the
areas of environmental engineering, geotechnical engineering, structural
engineering, and water resources engineering. The required curriculum
includes the fundamentals for each of these areas and provides an opportunity
for additional learning experiences with technical electives and a major design experience.

Teamwork, problem solving, and design exercises are interwoven throughout the curriculum; culminating in a two-semester, capstone design project during the senior year. Several courses include laboratories which develop experimental, teamwork, and communication skills. Technical reports and/or presentations required in several courses develop knowledge of contemporary issues and life-long learning skills, as well as communication skills. Relevant computer software is used throughout the curriculum. Students are strongly encouraged to prepare for a professional license by taking the national Fundamentals of Engineering (FE) exam prior to graduation. Students who excel academically are also well qualified to pursue graduate work in civil engineering or a related field.

To encourage undergraduate engineering students to extend their studies to include a graduate degree, the College of Engineering and Mines has combined programs which permit students to earn both Bachelor of Science/ Master of Engineering or Bachelor of Science/Master of Science degrees in an engineering discipline. These programs allow students to designate two three-credit hour courses to count for both B.S. and master’s degrees. The selected courses must have graduate course standing and must be designated when a student requests admission to the program.

See Combined Degree Program under the College of Engineering and Mines (p. 618) section for additional details.

The following are the educational objectives (EO) of the B.S. in Civil Engineering program:

• EO1 Graduates practice civil engineering, using knowledge and skills for problem analysis and solving, in a wide range of professional settings including consulting firms, government agencies and industries.

• EO2 Graduates work mainly in the areas of engineering design, project management, construction, contract administration, technical support, and research.

• EO3 Most graduates continue learning by participating in job related training activities, pursuing a professional engineering license, and/or attending graduate school.

• EO4 Most graduates contribute to the economic development of North Dakota and the surrounding region.

The civil engineering program is accredited by the Engineering Accreditation Commission of ABET.

In addition to the normal transfer credit stipulations, Distance Engineering Degree Program (DEDP) and transfer students in Civil Engineering must complete a minimum of 22 credit hours of CE 300-level or higher engineering coursework, including the CE 482 Civil Engineering Design and CE 483 Civil Engineering Design II course sequence.

B.S. in Civil Engineering

Required 134 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

Freshman Year
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Graphical Communication</td>
<td>3</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<td>Arts and Humanities</td>
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<td><strong>Total Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 101</td>
<td>Introduction to Civil Engineering and Sustainable Design</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 122 &amp; 122L</td>
<td>General Chemistry II or BOL 150 &amp; BOL</td>
<td>4</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
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<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
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<td>Arts and Humanities</td>
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<td><strong>Total Credits</strong></td>
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Sophomore Year

First Semester

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CE 313</td>
<td>General Surveying</td>
<td>2</td>
</tr>
<tr>
<td>CE 313L</td>
<td>General Surveying Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 201</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td>PHYS 251</td>
<td>University Physics I (includes lab)</td>
<td>4</td>
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<tr>
<td>GEOE 203 or GEOL 101</td>
<td>Earth Dynamics or Introduction to Geology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CE 202</td>
<td>Civil Engineering and Sustainable Design II</td>
<td>1</td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 203</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
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<tr>
<td>PHYS 252</td>
<td>University Physics II (includes lab)</td>
<td>4</td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
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Junior Year

First Semester

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<tbody>
<tr>
<td>CE 301</td>
<td>Civil Engineering Laboratory I</td>
<td>2</td>
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<tr>
<td>CE 306</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 351</td>
<td>Structural Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>CE 412</td>
<td>Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 202</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 250 or ME 370 or CHE 340</td>
<td>Ethics in Engineering and Science or Engineering Disasters and Ethics or Professional Integrity in Engineering</td>
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Second Semester

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<tbody>
<tr>
<td>CE 302</td>
<td>Civil Engineering Laboratory II</td>
<td>2</td>
</tr>
<tr>
<td>CE 423</td>
<td>Hydraulic Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 431</td>
<td>Environmental Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CE 451</td>
<td>Steel Design</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<td><strong>Total Credits</strong></td>
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Senior Year

First Semester

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<tr>
<td>CE 432</td>
<td>Environmental Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CE 453</td>
<td>Reinforced Concrete</td>
<td>3</td>
</tr>
<tr>
<td>CE 421</td>
<td>Hydrology</td>
<td>3</td>
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<tr>
<td>ENGR 460</td>
<td>Engineering Economy</td>
<td>3</td>
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<tr>
<td>CE 482</td>
<td>Civil Engineering Design</td>
<td>2</td>
</tr>
<tr>
<td>Technical Elective</td>
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<tr>
<td><strong>Total Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 414</td>
<td>Foundation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 416</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 444</td>
<td>Contracts and Specifications</td>
<td>3</td>
</tr>
<tr>
<td>CE 483</td>
<td>Civil Engineering Design II</td>
<td>2</td>
</tr>
<tr>
<td>Technical Elective</td>
<td></td>
<td>3</td>
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</tbody>
</table>
Courses

CE 101. Introduction to Civil Engineering and Sustainable Design. 1 Credit.
Course will be a series of lectures, discussions and group projects concerning the practice of civil engineering and sustainable design. Topics include: scope of civil engineering practice, professional practice issues, sustainable engineering design, ethics, communication skills, project management and team working, literature searches and information gathering, and career planning. Exposure to Grand Challenges. Prerequisite: CE major or department permission. S/U grading. S.

CE 202. Civil Engineering and Sustainable Design II. 1 Credit.
Course builds on the basic functions of the Civil 3D land systems design program from ENGR 101 and includes a team project with exposure to sustainable design functions, including activities such as: utilization of waste products and demolition materials, bench-scale pilot studies, preliminary design, product development, and preliminary product testing. Combined lecture and laboratory format is used to teach research, design, and development fundamentals. Students have access to Civil 3D software through the CEM computer system. Prerequisites: CE major and ENGR 101 and either CE 101 or permission of department. S.

CE 301. Civil Engineering Laboratory I. 2 Credits.
Course involves lab experiences dealing with: 1) determining soil index properties, grain size distribution, permeability, moisture density relations, shear strength, and consolidation of soils; 2) engineering properties of concrete, asphalt, steel, and composites; and 3) design of experiments. Students perform lab work in teams and communicate results by written reports. Prerequisites: CE major, ENGR 203, and ENGL 110. Corequisites: ECON 210 and CE 412. F, S, SS.

CE 302. Civil Engineering Laboratory II. 2 Credits.
Course involves lab experiences dealing with: 1) fluid properties, flow measurements, open channel flow, pipe flow, and hydraulic machinery; 2) water and wastewater treatment topics such as BOD, total and suspended solids, water hardness, chlorination, alkalinity, coagulation, and jar testing; and 3) design of experiments. Students perform lab work in teams and communicate results in written reports and oral presentation. Prerequisites: CE major, ENGR 203, and ENGL 110. Corequisites: ECON 210, CE 431, and CE 423. S, SS.

CE 306. Fluid Mechanics. 3 Credits.
Fluid properties; fluid statics and dynamics; transport theory and transport analogies, conservation of mass, energy, and momentum; dimensional analysis; boundary layer concepts; pipe flows; compressible flow; open channel flow. Prerequisites: PHYS 251 and MATH 265. F, S.

CE 313. General Surveying. 2 Credits.
Measurements of distances and angles; EDM; satellite and inertial systems; triangulation; differential leveling; horizontal curves; vertical curves; traverse surveys; U.S. public land surveys; earthwork; boundary surveys; construction surveys. Prerequisites: MATH 165. Corequisite: On-campus students must take CE 313L along with this class. F.

CE 313L General Surveying Laboratory. 1 Credit.
Course will involve laboratory assignments dealing with measurements of distances and angles; use of EDM, GPS, and automatic levels; traversing; leveling; horizontal curves; vertical curves; and topographic survey. Offered in Summer for DEED students. Prerequisite: DEED students must have completed CE 313. Corequisite: On-campus students must be enrolled in CE 313. F.

CE 351. Structural Mechanics. 4 Credits.
Reactions, shear and bending moment, plane and space trusses, influence lines, deflections, virtual work, energy methods, approximate analysis, consistent deformations method, slope deflection and moment distribution methods, introduction to matrix methods. Use of computer for analysis. Prerequisite: ENGR 203. F.

CE 397. Cooperative Education. 1-8 Credits.
A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. Repeatable to 24 credits. Prerequisite: Admission to the civil engineering program or consent of advisor. Repeatable to 24 credits. F, S, SS.

CE 412. Soil Mechanics. 3 Credits.
Course topics include principles of soil mechanics including weight-volume relationships, classification, compaction, effective stress, permeability and seepage, consolidation, shear stress, site exploration, introduction to lateral earth pressure, and slope stability. Prerequisite: ENGR 203. F.

CE 412L. Soil Mechanics Lab. 1 Credit.

CE 414. Foundation Engineering. 3 Credits.
Soil improvements and ground modifications, soil exploration and sampling, bearing capacity, spread footings, mat foundations, settlement analysis, drilled shaft and pile foundations, foundations on difficult soil. Prerequisite: CE 412. S.

CE 414L. Laboratory.

CE 416. Transportation Engineering. 3 Credits.
Transportation systems; transportation planning and future developments; computer aided design; design and analysis of transportation facilities including traffic operations, highway geometry, and pavement. Prerequisite: CE 412. S.

CE 421. Hydrology. 3 Credits.
Course topics include measurement, interpretation, analysis and application of hydrologic data; precipitation, evaporation and transpiration; runoff hydrographs; routing methods; groundwater; and snow hydrology. Computer applications. Prerequisite: CE 306. F.

CE 423. Hydraulic Engineering. 3 Credits.
Fluid statics and dynamics; open channel flow; transitions and controls; hydraulic structures; hydraulic machinery; hydraulic power conversion; and hydraulic modeling. Prerequisite: CE 306. S.

CE 423L. Hydraulic Engineering Laboratory. 1 Credit.

CE 431. Environmental Engineering I. 3 Credits.
Environmental quality, water quality modeling, water wastewater treatment systems, sludge processing, solid wastes, hazardous wastes, environmental law. Prerequisite: CE 306. S.

CE 432. Environmental Engineering II. 3 Credits.
Water distribution networks, mass curve analysis, wastewater collection systems, pumping systems for water and wastewater, system design project, computer-assisted design, confined spaces. Prerequisite: CE 306. F.

CE 434. Environmental Engineering Laboratory. 4 Credits.
Physical, chemical and biological methods used in environmental engineering, water chemistry, instrumental methods, lab tours. On demand.

CE 435. Hazardous Waste Management. 3 Credits.
Regulations, generation, storage, transportation, disposal, classification, fate and transport of contaminants, environmental audits, pollution prevention and management facilities, remediation alternatives, physical-chemical treatment, bioremediation, stabilization/solidification, thermal processes. Prerequisites: CE 306 and CHEM 121. S.

CE 444. Contracts and Specifications. 3 Credits.
Engineering contracts and specification essentials, legal aspects of engineering practice and employment; professional practice issues; procurement of work; governmental regulation. S.

CE 451. Steel Design. 3 Credits.
Selection of sections, bolted and welded connections, trusses, bearings, light gauge structural members, fatigue of structural members and introduction to plastic design. Prerequisite: CE 351. S.

CE 453. Reinforced Concrete. 3 Credits.
Materials and specifications, axially and eccentrically loaded columns, strength beam theory, shear stresses, bond and development length, serviceability, and one-way slabs. Prerequisite: CE major and CE 351. F.
CE 482. Civil Engineering Design. 2 Credits.
This is a comprehensive design course which integrates engineering design and engineering science components of previous and ongoing coursework into a major design experience. Design projects can be in the areas of environmental, geotechnical, structures, water resources, or transportation engineering. Course activities include defining the problem, formulating project objectives, gathering background information, scheduling the project, applying design standards and realistic constraints; developing design alternatives; and evaluating design alternatives. Other topics covered include project management, effective team-working, engineering ethics, and computer aided design. Group design reports and individual oral presentations are required. Prerequisites: CE 451, CE 412, CE 423 and CE 431. F.

CE 483. Civil Engineering Design II. 2 Credits.
This is a comprehensive design course which integrates engineering design and engineering science components of previous and ongoing coursework into a major design experience. Design projects can be in the area of environmental, geotechnical, structures, water resources, or transportation engineering. Course activities include developing and analyzing a detailed design, preparing plans and drawings, developing design specifications, and estimating construction costs. Other topics covered include professional practice issues and computer aided design. Group design reports and individual oral presentations are required. Prerequisites: CE 482 or departmental consent. S.

CE 490. Special Topics. 1-3 Credits.
Investigation of special topics dictated by student and faculty interests. Repeatable. Prerequisite: Department approval. Repeatable. F,S.

Communication Program (Comm)
http://www.arts-sciences.und.edu/communication

Antonova, Danes, Fiordo, Haslerud Opp, Jordheim, Kalbfleisch, Kenney, Kim, Lee, Myszkowski, Pasch, Rakow, Shafer, Trahant

The undergraduate curriculum of the Communication Program has recently been revised.

Current students in the major will have the option of completing their degree under the previous curriculum or the newly revised curriculum. New students will be enrolled into the new curriculum.

The Communication Program offers a comprehensive, integrated curriculum in communication focusing on how information processes and communication technologies affect and can benefit a diversity of local and global communities. It prepares undergraduate students for careers as ethical, competent, and professional communicators with a broad understanding of contemporary communication issues and with skills that are adaptable to a variety of contexts.

One major, Communication, is offered leading to the Bachelor of Arts degree. The curriculum also allows for tracks in either Strategic Communication or Journalism. A minor in Communication is also offered.

Facilities and Special Programs
The program has state of the art computerized writing, graphics, and editing laboratories, as well as its own reading room that houses a wide selection of daily and weekly newspapers, magazines and professional journals. The University’s Television Center facility is available for student training. The Communication Program also administers the Northern Interscholastic Press Association, which serves high school journalism programs in North Dakota and northern Minnesotta.

Student Opportunities
Students are encouraged to supplement classroom instruction through work on campus publications, a national award-winning television program, and supervised, professional internships. The strong support of alumni allows the program to award a number of scholarships to our admitted Communication majors.

Admission Requirements
After admission to the College of Arts and Sciences, students planning to pursue a major through the program can immediately declare Communication as their intended major.

Attaining Admitted Major status opens many restricted classes. In addition, students are eligible for communication scholarships when they are admitted majors.

College of Arts and Sciences
B.A. with Major in Communication
Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a four-year institution) including:

I. Essential Studies Requirements (see University Essential Studies listing.)

II. Major Requirements
Required minimum of 36 credits. A grade point average of 2.2 is required on all Communication courses, and a C or better in each course used for the 36-credit major.

Major Course Requirements
15 credits required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMM 102</td>
<td>Communication and the Human Community</td>
<td>3</td>
</tr>
<tr>
<td>COMM 103</td>
<td>Information, Technology and Social Change</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>COMM 200</td>
<td>Introduction to Media Writing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 410</td>
<td>Research Methods in Communication (junior or senior status required)</td>
<td>3</td>
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Total Credits 15

Experience
3 credits required with maximum of 6 credits allowed

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<th>Credits</th>
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<tbody>
<tr>
<td>COMM 329</td>
<td>Practicum (Consent of Instructor)</td>
<td>3-6</td>
</tr>
<tr>
<td>COMM 394</td>
<td>Individual Projects and Readings (Consent of Instructor)</td>
<td>3-6</td>
</tr>
<tr>
<td>COMM 497</td>
<td>Internship (Consent of Instructor)</td>
<td>3-6</td>
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Content Areas
6 credits required in each Areas A, B, and C.

Area A
Select two of the following: 6

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMM 300</td>
<td>Communication and Society</td>
<td>3</td>
</tr>
<tr>
<td>COMM 310</td>
<td>Media and Diversity</td>
<td>3</td>
</tr>
<tr>
<td>COMM 374</td>
<td>Principles of Strategic Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 402</td>
<td>Intercultural/International Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 404</td>
<td>Advertising and Society</td>
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<tr>
<td>COMM 414</td>
<td>Media Law and Ethics</td>
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<td>COMM 428</td>
<td>Media History</td>
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Area B
Select two of the following:

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<tbody>
<tr>
<td>COMM 212</td>
<td>Interpersonal Communication</td>
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</tr>
<tr>
<td>COMM 246</td>
<td>Journalistic Reporting and Editing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 302</td>
<td>Popular Culture</td>
<td>3</td>
</tr>
<tr>
<td>COMM 305</td>
<td>Web and Mobile Publishing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 324</td>
<td>Feature and Opinion Writing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 352</td>
<td>Writing for Public Relations</td>
<td>3</td>
</tr>
<tr>
<td>COMM 401</td>
<td>Organizational Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 430</td>
<td>AD/PR Campaigns</td>
<td>3</td>
</tr>
<tr>
<td>COMM 451</td>
<td>Risk and Crisis Communication</td>
<td>3</td>
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</table>

Area C
Select two of the following:
COMM 206 Digital Communication: Fundamentals 3
COMM 313 Persuasion 3
COMM 319 Digital Communication: Imaging 3
COMM 328 Community Journalism 3
COMM 339 Digital Video Production 3
COMM 345 Social Media Strategy 3
COMM 405 Social Implications of the Information Society 3

Students wishing to focus their coursework in Strategic Communication are advised to take 6 credits each in Areas A, B, and C from the following list of courses:

**Area A**
- COMM 300 Communication and Society 3
- COMM 374 Principles of Strategic Communication 3
- COMM 402 Intercultural/International Communication 3
- COMM 414 Media Law and Ethics 3

**Area B**
- COMM 352 Writing for Public Relations 3
- COMM 401 Organizational Communication 3
- COMM 430 AD/PR Campaigns 3
- COMM 451 Risk and Crisis Communication 3

**Area C**
- COMM 206 Digital Communication: Fundamentals 3
- COMM 313 Persuasion 3
- COMM 339 Digital Video Production 3
- COMM 345 Social Media Strategy 3

Students wishing to focus their coursework in Journalism are advised to take 6 credits each in Areas A, B, and C from the following list of courses:

**Area A**
- COMM 300 Communication and Society 3
- COMM 310 Media and Diversity 3
- COMM 414 Media Law and Ethics 3
- COMM 428 Media History 3

**Area B**
- COMM 246 Journalistic Reporting and Editing 3
- COMM 302 Popular Culture 3
- COMM 305 Web and Mobile Publishing 3
- COMM 324 Feature and Opinion Writing 3

**Area C**
- COMM 212 Interpersonal Communication 3
- COMM 246 Journalistic Reporting and Editing 3
- COMM 302 Popular Culture 3
- COMM 305 Web and Mobile Publishing 3
- COMM 324 Feature and Opinion Writing 3
- COMM 352 Writing for Public Relations 3
- COMM 401 Organizational Communication 3
- COMM 430 AD/PR Campaigns 3
- COMM 451 Risk and Crisis Communication 3

**Courses**

**COMM 102. Communication and the Human Community. 3 Credits.**
An introduction to the important concepts and principles of human communication, with a focus on how humans create meaningful worlds to live in through shared language, shared visual perception and interaction processes. Examination of the conflicts and opportunities that can result from communication differences within and among communities, with particular emphasis on gender, race and ethnicity, age, sexual orientation, class and physical ability. F,S.

**COMM 103. Information, Technology and Social Change. 3 Credits.**
Evolution of communication technology and the consequences for how people communicate and acquire information, including the impact of culture, economics and public policy on contemporary media practices. Current issues related to media content, access and effects are examined. F,S.

**COMM 110. Fundamentals of Public Speaking. 3 Credits.**
The theory and practice of public speaking with emphasis on content, organization, language, delivery, and critical evaluation of messages. Additional emphasis on student performance stressing original thinking, effective organization, and direct communication of ideas. F,S,SS.

**COMM 200. Introduction to Media Writing. 3 Credits.**
Introduction to writing in the various styles and forms required in journalism, advertising, broadcasting, public relations, electronic and speech communication. F,S.

**COMM 206. Digital Communication: Fundamentals. 3 Credits.**
An introduction to the theory and practice of digital communication for print, online and mobile media. Course emphasis is on a holistic approach to digital design including both theoretical knowledge and software expertise. Course involves creating a series of portfolio-ready digital artifacts. F.

**COMM 212. Interpersonal Communication. 3 Credits.**
Introduces fundamental concepts of communication between individuals. Explores aspects of self expression and relationship communication. To give insights into the dynamics of interpersonal communication. To aid in the understanding of how people present themselves to other people, and how others perceive them in return. F,S,SS.

**Note:** Additional prerequisites may apply to some courses. Check individual course descriptions.
COMM 246. Journalistic Reporting and Editing. 3 Credits.
Professional techniques of news gathering, editing, source analysis and information dissemination for diverse mass media audiences utilizing traditional and new technologies and methods. Prerequisites: COMM 200 or instructor consent. F.

COMM 300. Communication and Society. 3 Credits.
Explores the interrelationships of society and forms of communication. Objectives include developing knowledge of the media, an ability to discuss in an informed manner the issues of communication in a democratic society and to develop an awareness of intelligent use of the media. F,S.

COMM 302. Popular Culture. 3 Credits.
This course focuses on the critical analysis of cultures, their characteristics, and the relationship between media and broader cultural patterns. Students will research, report and critique contemporary cultural trends and social issues to produce depth reporting and informed commentary. Prerequisite: COMM 200 or consent of instructor. F.

COMM 305. Web and Mobile Publishing. 3 Credits.
This course investigates the changing dynamic of publishing. Moving from traditional print publication models, the course examines publishing for the web, mobile devices, blogs, increasing readership, self-publishing and peer-reviewed options. Course includes publication conceptualization, production, budgeting, pre-press and printing processes. S.

COMM 310. Media and Diversity. 3 Credits.
Study of minority status within mass media organizations and in media content from historical, contemporary and speculative points of view. F.

COMM 313. Persuasion. 3 Credits.
An examination of principles and practices of persuasion and its influence across communication contexts such as interpersonal, group, and mass communication. Emphasis will be placed on ethical standards and implication of persuasion and influence. F.

COMM 319. Digital Communication: Imaging. 3 Credits.
This course introduces students to the practice of digital imaging, including photographic principles, digital acquisition devices, software, and transmission for the web and other media. F.

COMM 324. Feature and Opinion Writing. 3 Credits.
Investigative reporting and writing for traditional and new media using innovative research and source analysis techniques. Includes methods for informed opinion and commentary writing. Prerequisites: COMM 200 or consent of instructor. S.

COMM 328. Community Journalism. 3 Credits.
Considers the role that news media can play in enhancing community life. May focus on the role of print and broadcast journalism in Native American communities, on the role of weekly newspapers in small, rural towns or on broadcast and print media in cities. Provides an in-depth introduction to an assessment of efforts to determine how new forms of news media could provide innovative service for communities. Prerequisite: COMM 200 or consent of instructor. S.

COMM 329. Practicum. 3 Credits.
Faculty supervised and graded experiences offered in a variety of communication contexts. A maximum total of 6 credits from COMM 329, 394, and 497 may be counted toward the 125 credits required for a degree. Prerequisite: Consent of Instructor. Repeatable to 6 credits. F,S.

COMM 329A. Practicum. 1-5 Credits.
Faculty supervised and graded experiences offered in a variety of communication contexts. Prerequisites: Junior standing and instructor consent. Repeatable to 5 credits. F,S.

COMM 329B. Practicum. 1-5 Credits.
Faculty supervised and graded experiences offered in a variety of communication contexts. Prerequisites: Junior standing and instructor consent. Repeatable to 5 credits. F,S.

COMM 339. Digital Video Production. 3 Credits.
This course offers an introduction to the theory and practice of modern digital video production utilizing a variety of production software techniques, industry best practices, and online/mobile technologies. This course provides a scholarly and production process link with the UND Television Center, and includes guided visit(s) to and learning experiences at the production studios. S.

COMM 345. Social Media Strategy. 3 Credits.
This course focuses on scholarly and commercial aspects of social media strategy as a Communicative practice. In particular, course topics include a variety of social media driven outcomes including social activism, constituent engagement, outreach and advocacy, reputation management, analytics and optimization, and enhancing the quality and impact of message transmission in the social online environment. S.

COMM 352. Writing for Public Relations. 3 Credits.
Intensive practice in preparing the most common types of materials used in public relations. Special emphasis on writing style and form, and effective media relations. Prerequisites: COMM 200 or consent of instructor. F.

COMM 374. Principles of Strategic Communication. 3 Credits.
This course introduces the fundamental theories, concepts, and applications of strategic communication to critically analyze its social influence and meet organizational goals. F.

COMM 394. Individual Projects and Readings. 1-6 Credits.
Individual projects or directed study related to topics, issues, or activities in communication studies. A maximum total of 6 credits from COMM 329, 394, and 497 may be counted toward the 125 credits required for a degree. Prerequisite: Consent of Instructor. Repeatable to 6 credits. F,S.

COMM 401. Organizational Communication. 3 Credits.
Analysis of communication behavior in formally structured relationships as it relates to the organization and to individuals. Special attention given to organizational style, status, trust and conflict-management. Informal communication networks and rumor are studied. S.

COMM 402. Intercultural/International Communication. 3 Credits.
This course will provide an overview of the study of intercultural and international communication. Topics addressed will include: history, literature, and culture of specific groups including racial, religious, and ethnic issues that affect communication patterns and outcomes. S.

COMM 404. Advertising and Society. 3 Credits.
Examines and evaluates the social, ethical and economic aspects of advertising. Attention is given to appraising the effects of advertising on the consumer and competition. F.

COMM 405. Social Implications of the Information Society. 3 Credits.
Considers and evaluates different perspectives on the information society, ranging from humanistic and Neomarxist critiques to the optimistic scenarios of some futurists. Examines the implications of new means of creating, storing, manipulating and disseminating information. Discussion of whether or not the potential benefits will be realized. S.

COMM 410. Research Methods in Communication. 3 Credits.
Introduction to methodologies of historical, descriptive, and experimental research with attention to interpreting research results, selecting research designs and conducting communication research projects. Prerequisites: COMM 102, COMM 103, COMM 110, COMM 200 and at least 75 credits completed. F,S.

COMM 414. Media Law and Ethics. 3 Credits.
This course introduces students to the contemporary legal and regulatory environment for media. The philosophical and historical background, and the development and court interpretations of the First Amendment are examined, along with the theories of libel law, right to privacy, copyright protection, access to information, and advertising and broadcast regulation. The ethical principles that guide media communication practices are explored with a particular attention to the concepts of public trust and public interest. S.

COMM 428. Media History. 3 Credits.
Origin and evolution of human communication, mass media and related technological innovations. Addresses mass media's historical influence on social, political and economic change, as well as on maintaining the status quo. S.

COMM 430. AD/PR Campaigns. 3 Credits.
This course explores audience segmentation, and qualitative and quantitative approaches to market research and campaign testing to develop research-driven advertising and public relations communication campaigns. F.

COMM 451. Risk and Crisis Communication. 3 Credits.
This course explores identifying risks to organizational goals and key stakeholders, and communicating effectively during crisis events to maintain organizational legitimacy. Risk and crisis key theories and concepts, applications and analysis are addressed. Prerequisite: COMM 200 or consent of instructor. S.
COMM 497. Internship. 1-3 Credits.
Supervised experience consistent with student’s career objectives. Formal application in advance of internship needs department approval. A maximum total of 6 credits from COMM 329, 394, and 497 may be counted toward the 125 credits required for a degree. Prerequisites: Consent of Instructor. Repeatable to 6 credits. S/U grading. F.S.S.

COMM 499. Special Topics. 1-3 Credits.
Selected topics in communication that allow students to study specific communication issues and/or topics that are not covered by regular department offerings. Repeatable to 6 credits. Repeatable to 6 credits. On demand.

Communication Sciences and Disorders (CSD)

arts-sciences.und.edu/communication-sciences-disorders

Cummings, Foley, Madden, Paulson, Rami (Chair), Robinson, Seddoh, Steen, Swisher, Weisz, and Wocken

The mission of the Department of Communication Sciences and Disorders (CSD) is to meet the needs of the University of North Dakota (UND) and its surrounding community in the discipline of communication sciences and disorders, especially in the area of speech-language pathology. Specifically, the mission of CSD is (1) to provide academic and clinical instruction, supervised clinical practica, and research experiences for undergraduate and graduate-level students; (2) to conduct research with the aim of contributing to the body of knowledge concerning communication processes and communication disorders; (3) to provide clinical services to individuals, groups, and agencies within North Dakota and the region; (4) to participate in the governance of the College of Arts and Sciences (A&S) and the University; and (5) to provide professional leadership within local, state and national organizations.

Academic Programs

The undergraduate coursework in Communication Sciences and Disorders is grounded in a liberal arts education. The undergraduate degree is designed to prepare the student to become a lifelong learner, critical thinker, and problem solver.

The coursework is also designed to prepare the undergraduate major to pursue professional and graduate work, including a graduate degree in Speech-Language Pathology or Audiology. A graduate degree in either field of communication disorders is required to work as a speech-language pathologist or audiologist.

College of Arts and Sciences

B.A. with Major in Communication Sciences and Disorders

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

(Laboratory science requirement to be met by 4 credits of biology, chemistry or physics)

II. The Following Curriculum

A. Major Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSD 223</td>
<td>Phonetics</td>
<td>3</td>
</tr>
<tr>
<td>CSD 231</td>
<td>Anatomy and Physiology of the Speech and Hearing Mechanism</td>
<td>4</td>
</tr>
<tr>
<td>CSD 232</td>
<td>Survey of Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 235</td>
<td>Speech and Hearing Science</td>
<td>4</td>
</tr>
<tr>
<td>CSD 333</td>
<td>Articulation and Phonological Development and Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 340</td>
<td>Normal Language Structure</td>
<td>3</td>
</tr>
<tr>
<td>CSD 343</td>
<td>Language Development</td>
<td>3-4</td>
</tr>
<tr>
<td>CSD 343L</td>
<td>Language Development Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>CSD 422</td>
<td>Neuroanatomy of Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 425</td>
<td>Language, Multiculturalism and Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 431</td>
<td>Introduction to Audiology</td>
<td>3</td>
</tr>
<tr>
<td>CSD 434</td>
<td>Aural Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>CSD 438</td>
<td>Craniofacial Anomalies</td>
<td>2</td>
</tr>
<tr>
<td>CSD 440</td>
<td>Language Disorders I</td>
<td>3</td>
</tr>
<tr>
<td>CSD 441</td>
<td>Language Disorders II</td>
<td>3</td>
</tr>
<tr>
<td>CSD 484</td>
<td>Clinical Practicum I: Speech-Language Pathology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Delete CSD 461)</td>
<td></td>
</tr>
<tr>
<td>CSD 485</td>
<td>Clinical Practicum II: Speech Language Pathology</td>
<td>3</td>
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Total Credits: 51-52

B. Major courses not required for the B.A., but recommended:

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td>PSYC 303</td>
<td>Research Methods in Psychology</td>
<td>4</td>
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</table>

Total Credits: 7

C. Courses required in other departments:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 209</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra (or higher)</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following (Gerontology):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PSYC 355</td>
<td>Adulthood and Aging</td>
<td></td>
</tr>
<tr>
<td>SOC 352</td>
<td>Aging and Society</td>
<td></td>
</tr>
<tr>
<td>SWK 313</td>
<td>Orientation to Gerontology</td>
<td></td>
</tr>
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</table>

Select one of the following (Physics or Chemistry):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHYS 130</td>
<td>Natural Science-Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 140</td>
<td>Physics for Poets</td>
<td></td>
</tr>
<tr>
<td>PHYS 161</td>
<td>Introductory College Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 211C</td>
<td>College Physics I</td>
<td></td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 23

D. Courses Required for Teacher Certification:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 400</td>
<td>School Programs in Speech-Language-Hearing</td>
<td>3</td>
</tr>
<tr>
<td>CSD 585</td>
<td>Practicum in the School Setting</td>
<td>10</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>or CSD 425</td>
<td>Language, Multiculturalism and Communication Disorders</td>
<td></td>
</tr>
</tbody>
</table>

Graduate students can choose courses from the list of 300-level courses above or from the higher level courses listed below:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 510</td>
<td>Early Intervention for Children with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>SPED 511</td>
<td>Identification and Assessment of Young Children with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>SPED 512</td>
<td>Methods and Materials for Preschool Children with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>SPED 514</td>
<td>Intervention Strategies with Infants and Toddlers</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Speech, Language and Hearing Clinic

The Clinic provides an opportunity for students to gain practical experience in speech and language evaluation and treatment procedures as student clinicians and provides a basis for research in the clinical process. This experience is under the direct supervision of departmental faculty who hold the Certificate of Clinical Competence of the American Speech-Language-Hearing Association. The Department of Communication Sciences and Disorders is

Services provided include evaluation and treatment of individuals with all types of speech and language disabilities and hearing impairments (including evaluations for hearing aid candidacy). Referrals to the Clinic may be made by anyone, and treatment is provided for individuals of all ages.

**Minor in American Sign Language and Deaf Studies**

**Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 101</td>
<td>American Sign Language I</td>
<td>2</td>
</tr>
<tr>
<td>CSD 102</td>
<td>American Sign Language II</td>
<td>2</td>
</tr>
<tr>
<td>CSD 201</td>
<td>American Sign Language III</td>
<td>2</td>
</tr>
<tr>
<td>CSD 202</td>
<td>American Sign Language IV</td>
<td>2</td>
</tr>
<tr>
<td>CSD 343</td>
<td>Language Development</td>
<td>3</td>
</tr>
<tr>
<td>CSD 363</td>
<td>Deaf Studies</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 209</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits: 21**

**Courses**

**CSD 101. American Sign Language I. 2 Credits.**
This course is designed to teach functional American Sign Language (ASL) which can be used in everyday interactions. The grammar and vocabulary of ASL will be learned within the context of communicative activities. Topics relating to Deaf Culture will be discussed throughout the course. F.

**CSD 102. American Sign Language II. 2 Credits.**
This course is a continuation of ASL I. Students will be responsible for all information from the previous units. The grammar and vocabulary of ASL will be learned within the context of communicative activities. Topics relating to Deaf Culture will be discussed throughout the course. Prerequisite: CSD 101. S.

**CSD 201. American Sign Language III. 2 Credits.**
This advanced course is a continuation of ASL I and II. Students will apply previous knowledge from ASL II as a tool to enrich their vocabulary and understanding of the structure of ASL. This course is designed to teach functional American Sign Language which can be used in everyday interactions. The grammar and vocabulary of ASL will be learned within the context of communicative activities. Topics relating to Deaf Culture will be discussed throughout the course. Prerequisite: CSD 101 and CSD 102. F.

**CSD 202. American Sign Language IV. 2 Credits.**
This advanced course is a continuation of ASL I, II, and III. Students will apply previous knowledge from ASL I, II, and III to deepen their understanding of the structure of ASL while continuing to increase their vocabulary base. Receptive and expressive skills will greatly be enhanced. As in the previous courses, grammar and vocabulary of ASL will be learned within the context of communicative activities. Topics relating to Deaf Culture will also be discussed throughout the course. Prerequisite: CSD 101 and CSD 102. F.

**CSD 223. Phonetics. 3 Credits.**
Introduction to Phonetics. Includes articulatory descriptions of the speech sounds of English and other languages, the International Phonetic Alphabet, coarticulatory phenomena, suprasegmentals, phonological features and phonological processes. Supervised practice in broad and narrow transcription of normal and disordered speech is provided. F.

**CSD 231. Anatomy and Physiology of the Speech and Hearing Mechanism. 4 Credits.**
Structure and function of the mechanisms involved in breathing, phonation, resonance, articulation and hearing. F.

**CSD 232. Survey of Communication Disorders. 3 Credits.**
Speech disorders: causes, symptoms, diagnosis and therapy of the common speech defects. F.

**CSD 235. Speech and Hearing Science. 4 Credits.**
An introduction to the normal processes of speech, hearing and language through the study of basic speech and hearing science exploring the scientific investigation of the physiological and acoustical parameters of speech. Prerequisites: CSD 231 and CSD 223, and MATH 103 or consent of instructor. S.

**CSD 333. Articulation and Phonological Development and Disorders. 3 Credits.**
Development, etiology, diagnoses and management of phonological and articulation disorders. Prerequisite: CSD 223. S.

**CSD 340. Normal Language Structure. 3 Credits.**
The purpose of this course is to learn to analyze the grammar of English, focusing on morphology and syntax. The knowledge gained will serve as a foundation for the analysis of normal and impaired language. Prerequisite: ENGL 209 or equivalent. S.

**CSD 343. Language Development. 3-4 Credits.**
The nature and development of linguistic content, form, and use from birth to adulthood are studied relative to the development of communication and speech; relative to cognitive, social, and physical development; and relative to cultural diversity. Prerequisites or Corequisites: ENGL 209, PSYC 241 and PSYC 250 and CSD 340; or equivalents. F.

**CSD 343L. Language Development Laboratory. 2 Credits.**
Laboratory component of CSD 343. Prerequisite or Corequisite: CSD 343. F.

**CSD 363. Deaf Studies. 4 Credits.**
The purpose of this course is to provide an introduction and broad overview of the history and culture of the Deaf community. A particular emphasis will be on the role of American Sign Language (ASL) in the values, norms, traditions, and identity that encompass the Deaf community. As well, the field of signed language interpreting will be discussed. S.

**CSD 400. School Programs in Speech-Language-Hearing. 3 Credits.**
This course covers the educational model of service delivery and how the speech-language pathologist works collaboratively in a school setting to meet the needs of students with speech, language, and hearing disabilities. Prerequisite: CSD 333 and CSD 343. F.

**CSD 422. Neuroanatomy of Communication Disorders. 3 Credits.**
A study of the essentials that form the basis for neuroanatomy, neuropsychology, neuropsychomacology, and neurology, with a special section of study dealing with the neurological bases for speech, language and hearing. Prerequisite: CSD 231. S.

**CSD 425. Language, Multiculturalism and Communication Disorders. 3 Credits.**
Study of language structure and its interaction with culture from the perspective of the concept of world view, and the application of this relationship to the practice of speech-language pathology. Prerequisites: ENGL 209, CSD 223 and 343. Corequisite: CSD 440. F.

**CSD 431. Introduction to Audiology. 3 Credits.**
Elementary structure and function of the hearing mechanism; basic psychophysical dimensions of the auditory mechanism; types of deficient hearing; pure tone threshold and screening audiometry. Students are required to do hearing testing to qualify for certification in speech and hearing. Prerequisites: CSD 231 and CSD 235, and MATH 103. F.

**CSD 434. Aural Rehabilitation. 3 Credits.**
Principles, techniques and clinical practice in the diagnosis and rehabilitation of hearing disorders in children and adults; auditory training, speech reading and hearing conservation. Prerequisites: CSD 431 and CSD 434, or consent of instructor. S.

**CSD 438. Craniofacial Anomalies. 2 Credits.**
An introduction to medical genetics and craniofacial anomalies and syndromes, the etiology of these disorders, and the assessment and treatment of related feeding and communication disorders. Prerequisites: CSD 223, CSD 231 and CSD 333. S.

**CSD 440. Language Disorders I. 3 Credits.**
The course covers the causes, identification, assessment, and remediation of language disorders. The focus is on the phonological, semantic, syntactic, and pragmatic aspects of language disorders. Prerequisite: CSD 343. F.
The course integrates the concepts learned in Language Disorders I with the assessment and remediation of specific disorders. It includes a more in-depth analysis of special topics. General principles of diagnostic testing, including criterion and norm referenced assessment tools, are discussed. Prerequisite: CSD 440. S.

CSD 484. Clinical Practicum I: Speech-Language Pathology. 3 Credits.
An introduction to the clinical process and speech and language intervention. Includes supervised observation of clinical intervention. F,S,SS.

CSD 485. Clinical Practicum II: Speech Language Pathology. 3 Credits.
Continuation of the content introduced in CSD 484 with increased emphasis on the clinical process and clinical skills. Includes supervised observation of direct clinical intervention. Prerequisite: CSD 484. F,S,SS.

CSD 487. Senior Honors Thesis. 1-6 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F,S,SS.

CSD 497. Special Problems in Communication Disorders. 1-3 Credits.
An examination of special topics in Communication Disorders. Prerequisite: Consent of instructor. Repeatable. On demand.

**Computer Science (CSci)**

http://www.cs.und.edu

Desell, Grant, Hu, Kerlin, Kim, Liu, Marsh (Chair), Reza and Stokke

The underlying goal of the Department of Computer Science is to provide up-to-date, quality instruction in its undergraduate and graduate programs. In support of this goal, a curriculum has been developed which encourages a formal, abstract, theoretical approach to the study of computer science while providing students with experience on state-of-the-art equipment. The degree programs are designed to provide a background of professional education for careers in business, science, government, and industry, and to furnish a strong foundation for graduate study in computer science.

The department offers a Bachelor of Science in Computer Science through the John D. Odegard School of Aerospace Sciences and a Bachelor of Arts with a Major in Computer Science through the College of Arts and Sciences. A minor in computer science is also available.

The B.S. program provides the strongest mathematical and scientific background. It is recommended for students who intend to pursue graduate studies or to seek employment involving technical or scientific applications of computing. The B.S. degree is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410-347-7700.

The B.A. program offers more flexibility with fewer requirements relating to science and mathematics, but with additional requirements for courses in the humanities. This degree program is recommended for students pursuing a broader-based liberal arts education.

Optional specializations in Network and Operating Systems Analysis, Software Engineering, Game Development and Computer Animation, and Information Technology are available in conjunction with the degree programs.

In addition to the majors and minor, several courses are offered to provide basic knowledge of computer technology and programming for students wishing to use the computer as a tool in other disciplines.

The B.A. and B.S. degrees are conferred upon students who successfully complete the requirements specified below with a minimum cumulative and institutional grade point average of 2.0, a minimum grade point average of 2.2 for all Computer Science courses used to fulfill the major requirements, and grades of 'C' or higher in all required Computer Science prerequisite courses.

B.A. with Major in Computer Science (p. 102) Optional Specializations (p. 102)

**John D. Odegard School of Aerospace Sciences**

**B.S. in Computer Science**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Requirements of the Odegard School of Aerospace Sciences. See College listing.

III. Courses from computer science as follows:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSCI 160</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 161</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 230</td>
<td>Systems Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 242</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 289</td>
<td>Social Implications of Computer Technology</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 363</td>
<td>User Interface Design</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 365</td>
<td>Organization of Programming Languages</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 370</td>
<td>Computer Architecture</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 435</td>
<td>Formal Languages and Automata</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 451</td>
<td>Operating Systems I</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 492</td>
<td>Senior Project I</td>
<td>2</td>
</tr>
<tr>
<td>CSCI 493</td>
<td>Senior Project II</td>
<td>2</td>
</tr>
<tr>
<td>CSCI 494</td>
<td>Special Projects in Computer Science (Co-Req CSCI 493)</td>
<td>1</td>
</tr>
<tr>
<td>CSCI Electives **</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Total Credits 50

* Grade of 'C' or higher required.

** A combined total of 6 credits from CSCI 260 Advanced Programming Languages, CSCI 297 Experiential Learning, CSCI 299 Topics in Computer Science, CSCI 397 Cooperative Education or CSCI 494 Special Projects in Computer Science may be applied toward these electives. The remaining electives must be UND Computer Science courses numbered 300 or above.

IV. Courses from other departments as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
<td>2</td>
</tr>
<tr>
<td>EE 202</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I &amp; MATH 166 and Calculus II</td>
<td>8</td>
</tr>
<tr>
<td>Approved math elective</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td>Approved probability/statistics elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Approved 2-semester laboratory science sequence</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>2 approved courses in science</td>
<td></td>
<td>6-8</td>
</tr>
</tbody>
</table>

Total Credits 35-38

**College of Arts and Sciences**

**B.A. with Major in Computer Science**

Required 125 hours (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. College of Arts and Sciences Requirements. See College listing.

III. Courses from Computer Science as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 160</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
</tbody>
</table>
CSCI 161  Computer Science II*  4
CSCI 230  Systems Programming*  3
CSCI 242  Algorithms and Data Structures*  3
CSCI 365  Organization of Programming Languages*  3
CSCI 370  Computer Architecture*  4
CSCI 435  Formal Languages and Automata  3
CSCI 451  Operating Systems I  3
CSCI 465  Principles of Translation  3
CSCI 492  Senior Project I  2
CSCI 493  Senior Project II  2
CSCI Electives **  12

Total Credits  46

* Grade of 'C' or higher required.
** Electives may be selected from CSCI 260 Advanced Programming Languages (at most 3 hours), CSCI 289 Social Implications of Computer Technology, CSCI 297 Experiential Learning, CSCI 299 Topics in Computer Science or CSCI 397 Cooperative Education (at most 3 hours) and any other UND Computer Science courses numbered 300 or above.

IV. Courses from other departments as follows:

Level II proficiency in a language other than English (Level IV recommended)

ENGL 209  Introduction to Linguistics  3
EE 201  Introduction to Digital Electronics  2
EE 202  Electrical Engineering Laboratory  1
MATH 208  Discrete Mathematics  3
ECON 210  Introduction to Business and Economic Statistics  3

Select one of the following:  3

PHIL 110  Introduction to Logic
PHIL 221  Symbolic Logic

Total Credits  15

Minor in Computer Science

20 credit hours from Computer Science including:

Select one of the following:  4

CSCI 160  Computer Science I
CSCI 130  Introduction to Scientific Programming
CSCI 161  Computer Science II

CSCI electives  12

Total Credits  20

* All 12 credit hours of Computer Science electives must be 200 level or above.

Optional Specializations

A student’s coursework in either the B.S. program, the B.A. program, or the Minor program above may be designed to complete one or more of the following specializations. Each specialization completed will be noted on the student’s academic record.

I. System and Programming Security

Coursework must include:

CSCI 327  Data Communications  3
CSCI 389  Computer and Network Security  3
MATH 425  Cryptological Mathematics  3
CSCI 455  Database Management Systems  3

Select two of the following:  6

CSCI 384  Artificial Intelligence
CSCI 427  Advanced Data Communications

CSCI 457  Electronic Commerce Systems

Total Credits  18

II. Software Engineering

Coursework must include:

CSCI 260  Advanced Programming Languages  3
CSCI 364  Concurrent and Distributed Programming  3
CSCI 463  Software Engineering  3

Program Specific Elective:  3

CSCI 363  User Interface Design (B.A. Students)
CSCI 465  Principles of Translation (B.S. Students)

Select one of the following:  1

CSCI 297  Experiential Learning
CSCI 397  Cooperative Education
CSCI 491  Seminars in Computer Science
CSCI 494  Special Projects in Computer Science

Select one of the following:  3

CSCI 562  Formal Specification Methods
CSCI 565  Advanced Software Engineering

Total Credits  16

III. Information Technology

Coursework must include:

CSCI 389  Computer and Network Security  3
CSCI 455  Database Management Systems  3
CSCI 457  Electronic Commerce Systems  3

Select one of the following:  1

CSCI 297  Experiential Learning
CSCI 397  Cooperative Education
CSCI 491  Seminars in Computer Science
CSCI 494  Special Projects in Computer Science

Select two of the following:  6

CSCI 260  Advanced Programming Languages
CSCI 327  Data Communications
CSCI 399  Topics in Computer Science
CSCI 513  Advanced Database Systems

Total Credits  16

A student’s coursework in the B.S. program may be designed to complete the following specialization. This specialization will be noted on the student’s academic record.

IV. Game Development and Computer Animation

Elective coursework must include:

CSCI 384  Artificial Intelligence  3
CSCI 463  Software Engineering  3
CSCI 446  Computer Graphics I  3
CSCI 448  Computer Graphics II  3
ART 110  Introduction to the Visual Arts  3
ART 112  Basic Design  3
PHYS 251  University Physics I  4
PHYS 252  University Physics II  4
MATH 207  Introduction to Linear Algebra  2

Total Credits  28

Courses

CSCI 101. Introduction to Computers. 3 Credits.

An overview of the fundamental concepts and applications of computer science. Topics include data storage, hardware, operating systems, and programming principles. Corequisite: CSCI 101T is recommended. F.S.SS.
CSCI 101T. Software Applications Tutorial. 1 Credit.
An introductory tutorial course to complement CSCI 101. Activities will include hands-on experience with operating systems and application software (including word processors, spreadsheets, and databases). Corequisite: CSCI 101 is recommended. On demand.

CSCI 120. Computer Programming I. 4 Credits.
An introduction to computer programming in a high-level language, with emphasis on problem solving and logical thinking. Students learn to design, implement, test, and debug programs for small-scale problems using elementary data types and control structures. Includes laboratory. On demand.

CSCI 130. Introduction to Scientific Programming. 4 Credits.
An introduction to scientific computing, with problem solving, algorithm development, and structured programming in a high-level language with an engineering and mathematical focus. Emphasis on learning how to design, code, debug, and document programs, using techniques of good programming style. Includes laboratory. F,S,SS.

CSCI 150. Introduction to Computer Science. 3 Credits.
This is an introductory course for prospective computer science majors as well as offering an introduction to computing for non-computer science majors. Students will receive a broad introduction to the discipline of computer science without the immersion into a programming language. Students will learn to write interactive Web-based programs. No previous computing or programming experience is assumed. On demand.

CSCI 160. Computer Science I. 4 Credits.
An introduction to computer science, with problem solving, algorithm development, and structured programming in a high-level language. Emphasis on learning how to design, code, debug, and document programs, using techniques of good programming style. Includes laboratory. F,S,SS.

CSCI 160L. Computer Prog I Lab.

CSCI 161. Computer Science II. 4 Credits.
A broadening of foundations for computer science with advanced concepts in computer programming. Includes an introduction to data structures, analysis of algorithms, and the theory of computation. Includes laboratory. Prerequisites: CSCI 130 or CSCI 160, and MATH 103 or MATH 107; concurrent enrollment in MATH 208 is recommended. F,S,SS.

CSCI 161L. Computer Prog II Lab.

CSCI 170. Computer Programming II. 4 Credits.
Advanced techniques in computer programming using a high-level language. Topics include the use of recursion, pointers, and fundamental data structures in developing small to medium-scale programs. Includes laboratory. Prerequisite: CSCI 120. On demand.

CSCI 199. Topics in Computing. 1-3 Credits.
Selected introductory-level topics in computing for students of all majors. Course may be repeated to 6 credits with different topics. Repeatable to 6 credits. On demand.

CSCI 230. Systems Programming. 3 Credits.
Focus on low level programming. Topics covered include pointers, memory management, code optimization, compiling and linking, and library management. Prerequisite: CSCI 161. S.

CSCI 242. Algorithms and Data Structures. 3 Credits.
Object-oriented implementations of complex data structures including lists, sets, trees, and graphs. Time and space analysis and classification of algorithms using upper bounds (big Oh), lower bounds (big Omega), and exact bounds (big Theta). Techniques for analysis of recursive algorithms including use of the "Master Theorem" for divide-and-conquer recurrences. Prerequisites: CSCI 161 and MATH 208. F,S.

CSCI 260. Advanced Programming Languages. 3 Credits.
Programming in a specific high-level language for students who are already proficient at programming in another high-level language. Course may be repeated for different languages. A student may not receive credit for both CSCI 260 and a 100-level programming course in the same language. Prerequisite: CSCI 161 or consent of instructor. Repeatable. F.

CSCI 289. Social Implications of Computer Technology. 3 Credits.
An introduction to the effects of computer technology on society and individuals and to ethical problems faced by computer professionals. Topics covered include privacy, the nature of work, centralization versus decentralization and the need for human factors analysis in the development of a new computer system. F.

CSCI 290. Cyber-Security and Information Assurance. 3 Credits.
An introduction covering the breadth of essential Cyber-Security and Information Assurance topics. Students will hone skills in observation, deduction, analysis, logical reasoning and critical thinking as they gain experience with non-technical and lightly technical aspects of Cyber-Security and Information Assurance through practical and real-world examples. S.

CSCI 297. Experiential Learning. 1-3 Credits.
A practical experience in which students offer their proficiency in computing as a resource or service for others. The experience may involve software development, software consulting and assistance, system administration, or instruction. Prerequisite: CSCI 161. Repeatable to 6 credits. S/U grading. F.

CSCI 299. Topics in Computer Science. 1-3 Credits.
Selected intermediate-level topics in computer science for students with some experience or previous coursework in computing. Course may be repeated up to 6 credits with different topics. Repeatable to 6 credits. On demand.

CSCI 327. Data Communications. 3 Credits.
An introduction to the concepts of data transmission, communication hardware and protocols, communication software and the design, performance and management of computer networks. Prerequisites: CSCI 230 and MATH 208. F.

CSCI 363. User Interface Design. 3 Credits.
A study of the design and implementation of user interfaces for software applications. Students will apply principles of interface design to build applications using a toolkit of graphical interface components. Required coursework includes a team project. Prerequisite: CSCI 161. F.

CSCI 364. Concurrent and Distributed Programming. 3 Credits.
This course focuses on concurrent object oriented programming and modern distributed/parallel programming models (such as OpenMP, CUDA, OpenCL and Actors). Students will utilize various high performance distributed computing technology. Topics covered will include shared and distributed memory systems, sockets, threads, and message passing. Prerequisites: CSCI 242 and CSCI 230. S, even years.

CSCI 365. Organization of Programming Languages. 3 Credits.
Compile and run time requirements of programming languages, parameter passing and value binding techniques. Vector and stack processing. Prerequisite: CSCI 242. S.

CSCI 370. Computer Architecture. 4 Credits.
Computer structure, machine presentation of numbers and characters, instruction codes and assembly systems. Introduction to hardware methodologies and software extensions to hardware in computers. Some topics on hardware and software selection will be discussed. Prerequisites: CSCI 230, EE 201, and EE 202. S.

CSCI 384. Artificial Intelligence. 3 Credits.
A survey of the applications and techniques of artificial intelligence. Topics include problem solving paradigms, tree searching, rule-based systems, theorem proving, knowledge representation, natural language processing, image processing, and computer learning. Prerequisite: CSCI 242. S.

CSCI 389. Computer and Network Security. 3 Credits.
This course introduces techniques for achieving security in multi-user standalone computer systems and distributed computer systems. Coverage includes host-based security topics (cryptography, intrusion detection, secure operating systems), network-based security topics (authentication and identification schemes, denial-of-service attacks, worms, firewalls), risk assessment and security policies. Prerequisite: CSCI 161. S.

CSCI 397. Cooperative Education. 1-2 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department, employer, and the UND Cooperative Education office. Repeatable to 6 credits. Prerequisites: Declared Computer Science major with 15 completed credits in CSCI including CSCI 161. Repeatable to 6 credits. S/U grading. F,S,SS.

CSCI 399. Topics in Computer Science. 1-3 Credits.
Selected topics in Computer Science which allow students to study specialized subjects. Repeatable to 12 credits. Prerequisite: Consent of instructor. Repeatable to 12 credits. On demand.

CSCI 427. Advanced Data Communications. 3 Credits.
Analysis of existing and future data communications technologies and protocols, including the modeling of realistic networked environments and the analysis of their performance. Prerequisites: CSCI 327. S, even years.
CSCI 435. Formal Languages and Automata. 3 Credits.
A study of automata, grammars, and Turing machines as specifications for formal languages. Computation is defined in terms of deciding properties of formal languages, and the fundamental results of computability and decidability are derived. Prerequisites: CSCI 242 and minimum second semester junior standing. F.

CSCI 445. Mathematical Modeling and Simulation. 3 Credits.
A study of various mathematical applications for digital computers, including the modeling, simulation and interpretation of the solution of complex systems. Prerequisites: CSCI 161 or CSCI 170, and MATH 166 and a statistics course. F, even years.

CSCI 446. Computer Graphics I. 3 Credits.
Introduction to computer graphics. Topics include display technology, light and color, 2D and 3D representations, image processing, ray-tracing, and computer animation. Prerequisites: CSCI 242, CSCI 363, and MATH 166. F, odd years.

CSCI 448. Computer Graphics II. 3 Credits.
A continuation of CSCI 446, topics covered include: history of games, game taxonomies, game design theory, computer game development, physics engines and AI engines. Prerequisite: CSCI 446. S, even years.

CSCI 451. Operating Systems I. 3 Credits.
Introduction to operating system theory and fundamentals. Topics include: multiprogramming, CPU scheduling, memory management methods, file systems, interprocess communication, and a survey of modern operating systems. Prerequisites: CSCI 242 and CSCI 370. F.

CSCI 452. Operating Systems II. 3 Credits.
A study of the implementation of operating systems and parts of operating systems, and development of system software. Prerequisites: CSCI 451. On demand.

CSCI 455. Database Management Systems. 3 Credits.
Database concepts, database administration, database design, and database performance, including the partial design of a DBMS application. Prerequisite: CSCI 242. S.

CSCI 457. Electronic Commerce Systems. 3 Credits.
A study of electronic commerce system architecture and electronic commerce content design and implementation. Topics include Internet basics, business issues, Web markup languages, static and dynamic Web programming, e-commerce content design and construction, and databases and host languages with embedded SQL such as JDBC. Prerequisite: CSCI 260. S, odd years.

CSCI 463. Software Engineering. 3 Credits.
This course teaches software engineering principles and techniques used in the specification, design, implementation, verification and maintenance of large-scale software systems. Major software development methodologies are reviewed. As development team members, students participate in a group project involving the production or revision of a complex software product. Prerequisites: CSCI 242 and CSCI 363. S.

CSCI 465. Principles of Translation. 3 Credits.
Techniques for automatic translation of high-level languages to executable code. Prerequisites: CSCI 365 and CSCI 370. F, odd years.

CSCI 491. Seminars in Computer Science. 1 Credit.
A course for advanced students. Repeatable to 3 credits. Prerequisite: Consent of instructor. Repeatable to 3 credits. S/U grading. F.S.

CSCI 492. Senior Project I. 2 Credits.
The first course in a two-semester sequence in which computer science majors undertake a culminating research or software development project. The course requires written documents, oral presentations, and peer review for the initial phases of the project, including a project proposal, a review of previous work, and a complete software design or research plan. Prerequisites: CSCI 242 and at least second-semester junior standing. Corequisites: Concurrent enrollment in CSCI 494 with student’s CSCI capstone project adviser is recommended. F.

CSCI 493. Senior Project II. 2 Credits.
The second course in a two-semester sequence in which computer science majors undertake a culminating research or software development project. The course requires written documents and oral presentations/demonstrations for both a preliminary and a final review of the completed project. Student must be concurrently enrolled in at least 1 credit of CSCI 494 with their CSCI capstone project adviser. Prerequisite: CSCI 492. Corequisite: CSCI 494. S.

CSCI 494. Special Projects in Computer Science. 1-3 Credits.
A course for advanced students. 1-3 credits varying with the choice of project. May be repeated (6 credits maximum). Prerequisite: Consent of instructor. Repeatable to 6 credits. F.S.

Counseling Psychology and Community Services (Coun)
http://education.und.edu/counseling-psychology-and-community-services/index.cfm

Bailey, Edwards, Juntunen (Ph.D Training Director), Navarro, Perry (M.A. Program Director and RHS Coordinator), Schroeder (RTS Coordinator), Walker (School Counseling Director), Wettersten (Chair) and Whitcomb

The Department of Counseling Psychology and Community Services offers graduate programs leading to the degrees of Master of Arts in Counseling and the Doctor of Philosophy in Counseling Psychology. The Department also offers Bachelor of Science degrees in Rehabilitation and Human Services (RHS) and in Recreation and Tourism Studies (RTS). The M.A. with a school counselor emphasis is accredited by the National Council for the Accreditation of Teacher Education (NCATE). The Ph.D. in Counseling Psychology is accredited by the American Psychological Association (APA) and prepares graduates for Psychologist licensure in North Dakota, as well as other states. coursework for the M.A. degree satisfies eligibility requirements for licensure as a Counselor, for School Counselor and Rehabilitation Counselor certification, and for Addiction Counselor licensure in North Dakota and other states. The Department is committed to diversity with a particular emphasis on providing graduate training for Native Americans interested in mental health careers.

Combined Program in Counseling with a Rehabilitation Emphasis

To encourage students who are majoring in Rehabilitation and Human Services to extend their studies to include a graduate degree, the Department of Counseling offers a Combined Program in Counseling with a Rehabilitation Emphasis. The Combined Program allows students to earn a bachelor’s degree in Rehabilitation and Human Services and a master’s degree in Counseling with a Rehabilitation Emphasis in approximately five years. This would be a year less than is typically required to complete these degrees separately.

The deadline for a completed application to be received in the School of Graduate Studies is February 1. In addition to the admission requirements for the Counseling master’s program, a completed application must include the following:

1. At least 95 credit hours (including credits in progress) towards the bachelor’s.
2. A degree in Rehabilitation and Human Services, including RHS 200 Helping Skills in Community Services, RHS 250 Contemporary Issues in Rehabilitation, RHS 350 Overview of Disabilities, and Parts IV and V in the RHS Program.
3. A minimum GPA of 3.0 in all undergraduate work.
4. A written statement of interest in Rehabilitation Counseling as a Profession.

Students are granted approved admission status in the School of Graduate Studies when they have completed a total of 125 undergraduate credits with an overall GPA of 3.0 or higher. This program allows students to designate two three-credit graduate courses to count for both degrees. These courses would be COUN 514 Rehabilitation Counseling: Assessment and Evaluation and COUN 519 Career Counseling.

The B.S. degree in Rehabilitation and Human Services and the M.A. degree in Counseling are granted at the same time. In the event that a student does not complete the graduate degree, the undergraduate degree is granted only after the completion of 125 credits, including an approved rehabilitation internship.

Degree Requirements

1. Completion of an additional 24 undergraduate credits during or after the senior year.
2. Completion of at least 60 credits of graduate course work, including:
University of North Dakota

Counseling Methods
Counseling Practicum
3
Criminal Law
Introduction to Criminal Justice
Introduction to Policing
3
3
Group Theory and Process
4
Introduction to Corrections
Administration of Criminal Justice Systems
3
3
Theories of Counseling, Personality and Development
Psychology of Women, Gender and Development
Multicultural Counseling
Coupled And Family Counseling
Counseling Practical
3
3
3
3
4

4. Completion of 8 credits of COUN 588 Rehabilitation Counseling Internship.
5. Completion of either COUN 997 Independent Study (2 cr) or COUN 998 Thesis (1-9 cr)

Courses
COUN 101. Career Exploration. 1 Credit.
The process of making career choices and decisions is explored through assessment, instruments, class activities, and assignments. Student interests, skills, and work values are explored and related to information about careers and job market trends. Recommended for students in the process of choosing an academic major. S/U grading. F,S.

COUN 250. Dialogue on U.S. Diversity. 3 Credits.
This seminar on diversity issues in the U.S. will cover group communication skills, psychological impact of social/cultural group identities and inequality. S.

COUN 399. Special Topics. 1-3 Credits.
Specially arranged seminars or courses on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate instructors are available. Repeatable to 6 credits. Repeatable to 6 credits. On demand.

Criminal Justice Studies (CJ)

http://www.arts-sciences.und.edu/criminal-justice

DiCristina, Gottschalk (Chair), Hume, Jordan, Matz, Mayzer and Meyer

This program is a cooperative venture that draws on the resources of the departments of anthropology, philosophy, sociology, and criminal justice. The purpose of the program leading to a Bachelor of Science in Criminal Justice Studies in the college of Arts and Sciences is to prepare students for positions as practitioners within criminal justice professions while also offering educational upgrading for individuals already working in criminal justice fields. By incorporating the various disciplines, departments and colleges along with their respective faculty, the program is able to integrate the various approaches and ideals to the study of criminal justice.

Admission Requirements
Students pursuing a major in criminal justice must be formally admitted to the program. To be formally admitted, students must have completed 45 total credit hours with a minimum overall grade point average of 2.70; must have completed the following courses with a minimum grade point average of 2.70; and declare their major in the College of Arts and Sciences.

CJ 201 Introduction to Criminal Justice
CJ 210 Introduction to Policing
CJ 270 Introduction to Corrections
SOC 253 Delinquency and Juvenile Justice

After the successful completion of all admission requirements (including GPA requirements), students will be notified that they have been accepted into the program. Once admitted, majors are required to maintain a GPA of 2.70 overall and in the major to graduate with a degree in Criminal Justice Studies. Failure to meet either or both of these requirements will result in the student being placed on probation in the major for one semester. Failure to maintain the requirements for two consecutive semesters may result in dismissal from the Program.

College of Arts and Sciences

B.S. in Criminal Justice Studies
Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum (42 credits):

Preadmission Requirements
CJ 201 Introduction to Criminal Justice
CJ 210 Introduction to Policing
CJ 270 Introduction to Corrections
SOC 253 Delinquency and Juvenile Justice

Required upper division courses
CJ 330 Criminological Theory
CJ 341 Criminal Law
CJ 342 Criminal Procedure
CJ 401 Administration of Criminal Justice Systems
SOC 323 Sociological Research Methods
SOC 326 Sociological Statistics
PHIL 460 Philosophy of Law

Select three of the following:
ANTH 345 Forensic Science
ANTH 346 Analysis of Forensic Evidence
CJ 302 Women, Crime, and Criminal Justice
CJ 350 Correctional Alternatives
CJ 351 Police Administration
CJ 352 Criminal Investigation
CJ 361 Victimology
CJ 430 Developmental Perspectives on Adolescent Problem Behavior
CJ 452 The Police Role in Society
SOC 252 Criminology

Total Credits 42

A concentration in a single supplementary field other than criminal justice studies is also required of all criminal justice majors. This concentration may be met in one of three ways:

1. a language proficiency of level IV in a modern foreign language;
2. completion of the four-course sequence in American Sign Language; or
3. 20 credit hours (at least nine of which must be numbered 300 or above) in any single subject matter taught at this University.

Minor in Criminal Justice Studies
21 credits required:

CJ 201 Introduction to Criminal Justice
CJ 210 Introduction to Policing
CJ 270 Introduction to Corrections
SOC 253 Delinquency and Juvenile Justice

Select three of the following:
ANTH 345 Forensic Science
ANTH 346 Analysis of Forensic Evidence
CJ 302 Women, Crime, and Criminal Justice
CJ 330 Criminological Theory
CJ 341 Criminal Law
CJ 342 Criminal Procedure
CJ 350 Correctional Alternatives
Courses

CJ 201. Introduction to Criminal Justice. 3 Credits.
An undergraduate study and overview of the criminal justice system emphasizing the "system," its legal actors and its political constraints. Designed for the beginning student in law enforcement, criminology, corrections, sociology, social welfare, government and pre-law. F.S.

CJ 210. Introduction to Policing. 3 Credits.
Introduces the student to the specific field of law-enforcement agencies. Provides an overview of federal, state, and local law enforcement agencies. Reviews the coordination requirements of the system. Prerequisite: CJ 201. S.

CJ 270. Introduction to Corrections. 3 Credits.
This course describes the corrections system as part of a larger criminal justice system. Students will be introduced to the history and practice of corrections from earlier forms of physical punishment to jail, probation, intermediate sanctions, prisons, parole, and the death penalty. Special topics in the field will also be addressed as appropriate. Prerequisite: CJ 201. F.S.

CJ 302. Women, Crime, and Criminal Justice. 3 Credits.
This class will explore the changing roles of women as offenders, as victims, and as professionals in the criminal justice system. Attention will be directed toward empirical findings, conflict theory insights, and the feminist perspective within the discipline. The basic goal of this course is to respectfully enhance understanding of the importance of gender equality within the field of criminal justice and to encourage self-examination of habitual modes of thinking and acting. Prerequisite: CJ majors and minors only. S.

CJ 320. Cybersecurity Law and Investigations. 3 Credits.
Cybersecurity Law and Policy will explore the regulatory, legal, and policy framework of cybersecurity. More specifically, this course will examine laws and policies to reduce cyber threats and address cyber privacy concerns. This course will provide students with a framework for understanding state and federal laws and regulations that govern this emerging field, as well as investigative techniques and strategies for investigation and enforcement on a global scale. S.

CJ 330. Criminological Theory. 3 Credits.
This class will provide an overview of a variety of criminological theories. Attention will be directed toward the study of the major theoretical schools of thought which have influenced the discipline of criminology. The basic goal of this course is to help the student develop an understanding of and appreciation for the insights gained by examining crime and criminals through different theoretical frameworks. Prerequisite: CJ majors and minors only. F.S.

CJ 341. Criminal Law. 3 Credits.
This course covers the fundamentals and foundations of American criminal jurisprudence with an emphasis on common law definitions of crimes and modern requirements for the criminalization of behavior, statutory laws. Prerequisite: Criminal Justice Majors and Minors or Forensic Science Majors. F.

CJ 342. Criminal Procedure. 3 Credits.
This course covers requirements of the American system of criminal procedure, especially regarding the legal requirements of search and seizure, interrogation, right to counsel, and eyewitness identifications. Special attention is given to the relationship between the 4th, 5th, 6th, 8th, and 14th amendments to the U.S. Constitution and the development of the law of criminal procedure. Prerequisite: Criminal Justice Majors and Minors or Forensic Science Majors. S.

CJ 350. Correctional Alternatives. 3 Credits.
This course is designed to explore and evaluate intervention strategies developed in the criminal justice system as alternatives to institutional corrections in the sentencing of adjudicated persons. Among these options this course looks for community corrections, parole, house arrest, restitution, community service, and the development of intervention strategies in support of the dispositions. Prerequisite: Criminal Justice majors and minors only. S.

CJ 351. Police Administration. 3 Credits.
Principles of police administration and organization for a modern police agency. Included are planning and development of organizations, direction, goal identification, etc. Prerequisites: CJ 210; CJ majors and minors only. F.

CJ 352. Criminal Investigation. 3 Credits.
An overview and examination of basic principles and techniques in the criminal investigations procedures and the rules of the law of evidence in criminal court proceedings. Prerequisites: CJ 210, CJ majors and minors, and forensic science majors. F.

CJ 356. Victimology. 3 Credits.
This course will provide an overview of the literature and research concerning victimization. Attention will be directed toward current trends concerning the victim in the American criminal justice system, with particular emphasis on measuring victimization, fear of crime, the impact of victimization on the individual, and victims rights and compensation initiatives. The basic goal of this course is to help the student develop an understanding of the impact of victimization on the victim, those associated with the victim, the criminal justice system, and each of us as individuals. Prerequisite: Criminal Justice majors and minors only. F.

CJ 397. Cooperative Education. 1-6 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department, and employer. Students may be required to have a criminal background check performed with results deemed favorable by the field agency as a condition of their initial enrollment and/or continued enrollment in cooperative education credits. Repeatable to 12 credits. Prerequisites: CJ 494; CJ majors and minors only. Repeatable to 12 credits. S/U grading. F,S,SS.

CJ 399. Problems in Criminal Justice. 1-3 Credits.
Students study special topics under the direction and supervision of a member of the faculty; prior consent of the instructor is required before enrollment. Repeatable to 6 credits. Prerequisites: Criminal Justice majors and minors only and consent of instructor. Repeatable to 6 credits. F,S,SS.

CJ 401. Administration of Criminal Justice Systems. 3 Credits.
This course is a senior capstone intended to integrate material across the criminal justice curriculum. The course explores various definitions of justice as those concepts bear on the criminal justice system as well as the political philosophical underpinnings of the American criminal justice system. Finally, the course evaluates criminal justice policies with respect to these principles of justice and philosophical foundations. Prerequisites: Senior standing and CJ major. F.S.

CJ 430. Developmental Perspectives on Adolescent Problem Behavior. 3 Credits.
This course on developmental criminology provides the criminal justice student with an overview of theory and research on adolescence. Cognitive, emotional, moral, physical, and social developments from puberty to early adulthood will be discussed and related to the explanation of problem behaviors, e.g., substance use, delinquency, sexual activity, and school failure. Prerequisite: CJ majors and minors only. F.

CJ 440. Evidence-Based Practices and Programs in Criminal Justice. 3 Credits.
This course will focus on the development and identification of evidence-based practices and programs (a.k.a., EBP) in criminal justice. A review of practices and programs in each area of the justice system will be explored including the juvenile justice system, policing, sentencing, and corrections. The course will rely heavily on systematic reviews of the empirical literature from which criminal justice practices and programs are deemed as effective, promising, or ineffective. This will include a review of work conducted by the Office of Juvenile Justice and Delinquency Prevention (OJJDP), the National Institute of Justice (NIJ), and other governmental efforts to promote empirically-justified programs. Prerequisites: CJ majors and minors only. Prerequisites or Corequisites: SOC 323, SOC 326, CJ 350, and CJ 351 are highly recommended. F.
**CJ 452. The Police Role in Society. 3 Credits.**
The functions and role of police in society with a focus on contemporary issues in police organization and administration. Prerequisite: CJ major and minors only. S.

**CJ 491. Orientation to Administrative Internship. 1 Credit.**
This orientation class will provide you with an introduction to the internship and cooperative education processes. Attention will be directed toward polishing the thinking skills, ethics, and job skills necessary to obtain and maintain an internship, attend graduate school, and/or secure a work position. The primary goal of this course is to provide support and guidance to qualified students attempting to secure a criminal justice internship or cooperative education position. Students may be required to have a criminal background check performed with results deemed favorable by the field agency as a condition of their initial enrollment in internship or cooperative education credits. Prerequisite: Consent of instructor. S.

**CJ 494. Readings in Criminal Justice. 1-6 Credits.**
Selected readings with oral and/or written reports. Repeatable to 12 credits. Prerequisites: CJ majors and minors only and consent of instructor. Repeatable. F,S,SS.

**CJ 497. Administrative Internship. 1-6 Credits.**
On-the-job training in a criminal justice position with a final report and analysis of the agency by the intern. Students may be required to have a criminal background check performed with results deemed favorable by the field agency as a condition of their initial enrollment and/or continued enrollment in internship credits. Repeatable to 12 credits. Prerequisites: CJ 491 and instructor consent. Repeatable to 12 credits. S/U grading. F,S,SS.

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**Earth System Science and Policy (ESSP)**

http://essp.und.edu/

Hammond, Laguette (Chair), Romsdahl, VanLooy (Graduate Director), Zhang and Zheng

**Undergraduate Minor in Sustainability Studies**

The ESSP Minor in Sustainability Studies is to help future leaders of society acquire knowledge and develop skills in building a sustainable stewardship of our planet, by seeking balance between the three sustainability pillars (environment, society, economy). The integrated curriculum of the Minor will promote critical thinking and problem solving through a combination of classroom learning and studies of research and management of Earth system resources.

The core objectives for the ESSP Minor in Sustainability Studies are:

1. To help students acquire interdisciplinary knowledge and understanding of theories and practices of sustainability;
2. To engage students in active learning opportunities which develop skills in writing and critical analysis, and an appreciation for valuing diversity both in culture and the environment;
3. To apply a holistic/systems approach to problem solving within the coupled human-natural system; and
4. To prepare students to be life-long learners and competitive professionals in a variety of careers.

Upon completion of the program students will have acquired

1. the fundamentals of sustainability and sustainability science;
2. a multidisciplinary approach to problem solving for sustainability and sustainability-related issues;
3. a set of skills and tools pertinent to solve problem within the coupled human-environment.

Details pertaining to minor requirements and courses offered can be found in the "minor" and "courses" links above. For other questions, or if you wish to apply for the minor, please contact Dr. Romsdahl.

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**Minor in Sustainability Studies**

**Required 21 credits including:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESSP 160. Sustainability &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>ESSP 200. Sustainability Science</td>
<td>3</td>
</tr>
<tr>
<td>Two electives from the following proposed ESSP courses</td>
<td>6</td>
</tr>
<tr>
<td>ESSP 330. Environmental Change: Adaptation &amp; Mitigation</td>
<td></td>
</tr>
<tr>
<td>ESSP 310. Sustainable Food Systems</td>
<td></td>
</tr>
<tr>
<td>ESSP 320. Land and Water Sustainability</td>
<td></td>
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<tr>
<td>ESSP 333. Oceanography</td>
<td></td>
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<tr>
<td>ESSP 420. Sustainable Energy</td>
<td></td>
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<tr>
<td>ESSP 450. Environmental and Natural Resource Economics</td>
<td></td>
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<tr>
<td>ESSP 460. Global Environmental Policy</td>
<td></td>
</tr>
<tr>
<td>ESSP 499. Special Topics in Sustainability</td>
<td></td>
</tr>
<tr>
<td>ESSP 570. Communicating Environmental Information</td>
<td></td>
</tr>
</tbody>
</table>

Three additional electives ^1^ 9-10

Total Credits 21-22

^1^ These may be fulfilled with ESSP courses or options from an approved list of courses in other UND departments; only two courses can be applied from the same department outside ESSP. The electives will be approved based on their topical contributions to the fundamentals of the sustainability pillars: environment, society and/or economy. The approved list may be subject to change each academic year. Additional or alternative course electives may be approved by the Coordinator of the ESSP Minor in Sustainability Studies on a semester by semester basis or upon student request.

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**Courses**

**ESSP 160. Sustainability & Society. 3 Credits.**
Human interactions with the natural environment are often perceived as conflicts between environmental protection and socio-economics. Sustainability attempts to redefine that world view by seeking balance between the ‘three Es’ - environment, economy, equity. This course examines the concept of sustainability, the theory behind it, and what it means for society. S.

**ESSP 200. Sustainability Science. 3 Credits.**
This course will provide an integrated, system-oriented introduction on the concepts, theories and issues surrounding a sustainable future for humans and the Planet Earth. The course will address the concept of sustainability, the concept of a system, explore human world views, provide an introduction to energy, complexity and ecosystems, and examine resources use, food production, industrial development and the prospects for a sustainable future. F.

**ESSP 310. Sustainable Food Systems. 3 Credits.**
This course will examine the need for development of sustainable food production systems. The course will introduce the concept of an integrated agro-ecosystem. Students will learn how food production systems work, how they impact natural ecosystems, how fragile the human food resource has become, and gain an appreciation of the complexity of relationships between humans and food. F, even years.

**ESSP 320. Land and Water Sustainability. 3 Credits.**
This course covers topics of sustainability of physical landscapes and water on the Earth. Class lectures will introduce concepts related to landscape use, perception of landscape and water use as a resource, and most importantly how to use the physical landscape and freshwater as a resource in a manner to which it will be viable for future generations (i.e. landscape and water resource sustainability). Topics include, but are not limited to snow and glacier melt water, ground water, mountain environment resources, river flood plain land use, and water use in desert environments. S.

**ESSP 330. Environmental Change: Adaptation & Mitigation. 3 Credits.**
The objective is to introduce the varieties of adaptation and mitigation strategies to address four main sustainability challenges: land use/land cover change, climate change, water security, and biodiversity loss. The major physical processes of the Earth systems will be examined, together with the natural and anthropogenic changes in these processes; then, the societal impacts from modifications to the Earth systems will be described; finally, the strategies of adaptation and mitigation will be compared, using a variety of regional case studies as examples. S.
ESSP 333. Oceanography. 3 Credits.
Oceanography introduces the ocean and the study of the ocean, which regulates our climate, maintains our atmosphere, and serves as an enormous resource. The course explores all aspects of the oceans- their physics, chemistry and biology, as well as the structure of the basins that contain them. Students will learn how the oceans interact with the atmosphere and the solid Earth, understand the role played by the oceans, not only as a producer of food and source of recreation, but as a transporter of heat energy, sink for greenhouse gases, and moderator of the climate. In the end, students will come away with a deeper understanding of how the ocean works and greater appreciation for the benefits we derive from it. S, even years.

ESSP 420. Sustainable Energy. 3 Credits.
This course is an interdisciplinary exploration of Sustainable Energy. The interdisciplinary exploration includes the analysis of renewable energy systems as well as the socio-economical, political, and environmental aspects of renewable energy. The course will specifically analyze the origin and dimensions of global energy issues and identify how renewable energy issues and policies are critical to the sustainable future of global environmental quality, economic growth, social justice, and democracy. S.

ESSP 450. Environmental and Natural Resource Economics. 3 Credits.
This course will cover the general topics in the field of environmental and natural resource economics: market failure, pollution regulation, the valuation of environmental amenities, the use of renewable and non-renewable resources over time, and the economics of biodiversity conservation, climate change and sustainability. We will analyze the issue of efficient use of resources over time, whether market equilibrium achieves an efficient outcome, common property resources, imperfect competition in energy market, and uncertainty, irreversibility and discounting related issues in environmental policy design. The course has a strong focus on the interaction between human society and natural environmental systems and the connection between market equilibrium and social sustainability. Prerequisite: ECON 201 or consent of instructor. F.

ESSP 460. Global Environmental Policy. 3 Credits.
Governance and policy are the most common strategies used to address environmental problems. This course introduces students to the foundation, development, actors, process, challenges, and future outlook of global environmental policy. By navigating various levels of US and global governance, students will explore a variety of concepts and principles in the development and implementation of environmental policies. S, even years.

ESSP 499. Special Topics in Sustainability. 1-4 Credits.
Investigation and detailed study of special topics related to sustainability issues. The course may include a lab if applicable. Repeatable once with different topic. Maximum of 8 credits. Repeatable to 8 credits. On demand.

Economics (Econ)


Baghei, Beiderman, Flynn (Chair), Goenner, Hagen, Lee, O’Neil, Owens, Simlai, Tan, Wang and Yang

Economics is the study of how scarce resources are mobilized to meet the economic goals of individuals, businesses, organizations, governments and societies. The study of Economics is typically divided into two parts: macroeconomics (or aggregate economic analysis) studies economics from a broad-based perspective, including problems and issues such as unemployment, inflation and economic growth; microeconomics studies economics in terms of individual components, including problems and issues such as product pricing, competition, regulation and international trade. Students of Economics can expect to become familiar with key economic concepts and laws which give them an analytical perspective that is unique to this discipline, but of is of great importance to individuals and to society.

The mission of the Economics Faculty falls into several important and interdependent areas. The faculty offers an exciting curriculum that reflects the latest advances in the discipline and reflects the skills used by professional economists. The courses also foster an understanding of the workings of modern economies at regional, national and international levels. The Economics Faculty carries out research objectives, consistent with those reported by the University and the College of Business and Public Administration. This research is published in leading professional journals and other research outlets. The Economics Faculty provides service-related and contracted research to the city, region and state, as well their expertise to the college, university, community, region, the state and professional organizations.

All programs in Economics include the necessary undergraduate economics courses for students who intend to pursue graduate level study. In addition, the major in Business Economics and the major in Economics offer a quantitative track which is recommended for students preparing for graduate study in Economics or Actuarial Science. In addition to the aforementioned undergraduate degrees, the Economics faculty offers a Masters of Science in Applied Economics degree. Please see the graduate section (p. 345) for more information.

B.B.A. with Major in Business Economics (p. ) B.A. with Major in Economics (p. )

College of Business and Public Administration

B.B.A. with Major in Banking and Financial Economics

The Economics Faculty together with other faculty in the College of Business and Public Administration offer a major in Banking and Financial Economics that is intended to prepare students for employment with financial institutions and government. The major is comprised of a comprehensive curriculum that provides a background in basic business, economic theory, the principles and practices of banks and other financial institutions, bank regulation, macroeconomic policy and international finance. Experience has shown the graduates of this program are prepared to immediately function in highly responsible positions in financial institutions and regulatory agencies.

All B.B.A. candidates must fulfill the College of Business and Public Administration degree requirements.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing: 39 credit hours).

The following are required by CoBPA (12 credit hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>Total</td>
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<td>15</td>
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</tbody>
</table>

* MATH 165 Calculus I, may be substituted for MATH 146 Applied Calculus I.

II. College of Business and Public Administration Core Requirements (40 credit hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>
### B.B.A. with Major in Business Economics

The major in Business Economics is offered through the College of Business and Public Administration. This program emphasizes the business firm — integrating economics with related areas in marketing, management, accounting, finance, and quantitative analysis. Students who complete a major in Business Economics possess a comprehensive background in the basic foundations of a business as well as the analytical skills in economics increasingly required to be successful in the business world at local, regional, national and international levels. All B.B.A. candidates must fulfill the College of Business and Public Administration degree requirements.

Required 125 credit hours (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

#### I. Essential Studies Requirements

- COMM 110 Fundamentals of Public Speaking 3
- MATH 103 College Algebra 3
- MATH 146 Applied Calculus I ** 3
- POLS 115 American Government I 3

Select one of the following:

- ANTH 171 Introduction to Cultural Anthropology 3
- PSYC 111 Introduction to Psychology 3
- SOC 110 Introduction to Sociology 3

**Total Credits**: 40

#### II. College of Business and Public Administration Core Requirements

- Required 15 credit hours:
  - ACCT 200 Elements of Accounting I 3
  - ACCT 201 Elements of Accounting II 3
  - ACCT 315 Business Law I 3
  - ECON 201 Principles of Microeconomics 3
  - ECON 202 Principles of Macroeconomics 3
  - ECON 210 Introduction to Business and Economic Statistics 3
  - ECON 303 Money and Banking 3
  - ISBC 217 Personal Productivity with Information Technology 1
  - ISBC 217 Fundamentals of Computer Information Systems 3
  - FIN 310 Principles of Financial Management 3
  - MGMT 300 Principles of Management 3
  - MGMT 301 Operations Management 3
  - MGMT 475 Strategic Management 3
  - MRKT 305 Marketing Foundations 3

**Total Credits**: 40

#### III. Required Major Courses

- Required 27 credit hours:
  - ACCT 301 Intermediate Accounting I 3
  - ACCT 302 Intermediate Accounting II 3
  - ECON 395 Special Topics in Economics 1-3
  - ECON 397 Cooperative Education 1-4
  - ECON 410 Empirical Methods in Economics I 3
  - ECON 411 Economic Forecasting 3
  - ECON 414 Managerial Economics 3
  - ECON 416 Mathematics for Economists 3
  - ECON 497 Internship 1-4
  - FIN 321 Real Estate Finance and Investment 3
  - FIN 324 Real Estate Appraisal 3
  - FIN 350 Financial Statement Analysis 3
  - FIN 420 Investment Analysis and Portfolio Management 3
  - FIN 450 Financial Derivatives 3
  - FIN 491 Senior Topics in Finance 3

* ACCT 218 Advanced Spreadsheet Applications is waived as a prerequisite for Banking and Financial Economics majors.

**Total Credits**: 27

#### IV. Elective Major Courses: Choose at least 12 credit hours from the following:

- ACCT 315 Business Law I 3
- ECON 201 Principles of Microeconomics 3
- ECON 202 Principles of Macroeconomics 3
- ECON 210 Introduction to Business and Economic Statistics 3
- ECON 303 Money and Banking 3
- ISBC 217 Personal Productivity with Information Technology 1
- ISBC 217 Fundamentals of Computer Information Systems 3
- FIN 310 Principles of Financial Management 3
- MGMT 300 Principles of Management 3
- MGMT 301 Operations Management 3
- MGMT 475 Strategic Management 3
- MRKT 305 Marketing Foundations 3

**Total Credits**: 15

#### III. Required Major Courses

- Required 15 credit hours:
  - ECON 308 Intermediate Microeconomic Theory 3
  - ECON 309 Intermediate Macroeconomic Theory and Policy 3
  - ECON 338 International Economics 3
  - ECON 410 Empirical Methods in Economics I 3
  - ECON 414 Managerial Economics 3

**Total Credits**: 15

#### IV. Elective Major Courses: Choose from either Option A, Option B, or a 12 credit hour combination from Options A and B below.

**Option A - Choose at least 12 credit hours from the following:**

- ECON 305 Principles of Banking I 3
- ECON 324 Public Finance 3
- ECON 330 Business and Economic History 3
- ECON 341 Labor Economics and Labor Relations 3
- ECON 355 Government Regulation of Business 3
- ECON 380 Global Economic Development 3
- ECON 395 Special Topics in Economics 1-3
- ECON 397 Cooperative Education 1-4
- ECON 400 History of Economic Thought 3
- ECON 405 Bank Regulation 3
- ECON 409 Current Issues in Macroeconomic Policy 3
- ECON 411 Economic Forecasting 3
- ECON 416 Mathematics for Economists 3
- ECON 438 International Money and Finance 3
- ECON 489 Senior Honors Thesis 1-8

**Total Credits**: 15

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* This course satisfies part of the ES Social Sciences requirement and carries a Q designation.
** This course satisfies part of the ES Math, Science, and Technology requirement and carries a Q designation.
I. Essential Studies Requirements (see University ES listing; 39 credit hours)

II. Required Major Courses (24 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
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</tr>
<tr>
<td>ECON 309</td>
<td>Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 338</td>
<td>International Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 410</td>
<td>Empirical Methods in Economics I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 24

* This course satisfies part of the ES Social Sciences requirement and carries a Q designation.
** This course satisfies part of the ES Math, Science, and Technology requirement and carries a Q designation.

III. Elective Major Courses: Choose from either Option A, Option B, or a 12 credit hour combination from Options A and B below.

Option A - Choose at least 12 credit hours from the following:

<table>
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<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ECON 305</td>
<td>Principles of Banking I</td>
<td>3</td>
</tr>
</tbody>
</table>

College of Arts and Sciences

B.A. with Major in Economics

The major in Economics provides a critical examination of how the economic system works in the United States and throughout the world. The introductory courses are surveys of economic problems, policies, and theory; the required courses in micro theory and macro theory give a deeper analytical foundation. Electives permit further study in a wide range of fields, including international trade and finance, public sector economics, economic development, economic history, capital theory and finance, labor economics, income distribution, political economy, financial markets, and public policy analysis. The major in Economics provides a general background that is useful to those planning careers in law, government service, or business, as well as those planning careers as professional economists. Professional economists work as college professors, as researchers for government agencies, in businesses and consulting firms, and as administrators and managers in a wide range of fields.

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing; 39 credit hours)

II. Required Major Courses (24 credit hours):

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<td>ECON 338</td>
<td>International Economics</td>
<td>3</td>
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<tr>
<td>ECON 410</td>
<td>Empirical Methods in Economics I</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 24

* This course satisfies part of the ES Social Sciences requirement and carries a Q designation.
** This course satisfies part of the ES Math, Science, and Technology requirement and carries a Q designation.

III. Elective Major Courses: Choose from either Option A, Option B, or a 12 credit hour combination from Options A and B below.

Option A - Choose at least 12 credit hours from the following:

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Principles of Banking I</td>
<td>3</td>
</tr>
</tbody>
</table>

Minor in Economics

Students who are interested in obtaining a basic background in Economics to complement their chosen major course of study may elect a minor in Economics offered through the College of Arts and Sciences.

I. Required courses (15 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>ECON 308</td>
<td>Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 309</td>
<td>Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 15

II. Economics electives (5 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 205</td>
<td>Principles of Banking I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 204</td>
<td>Principles of Banking I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 324</td>
<td>Public Finance</td>
<td>3</td>
</tr>
<tr>
<td>ECON 330</td>
<td>Business and Economic History</td>
<td>3</td>
</tr>
<tr>
<td>ECON 331</td>
<td>Business and Economic History</td>
<td>3</td>
</tr>
<tr>
<td>ECON 332</td>
<td>International Economics</td>
<td>3</td>
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<tr>
<td>ECON 333</td>
<td>International Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 334</td>
<td>Government Regulation of Business</td>
<td>3</td>
</tr>
<tr>
<td>ECON 335</td>
<td>Global Economic Development</td>
<td>3</td>
</tr>
<tr>
<td>ECON 336</td>
<td>Special Topics in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>ECON 400</td>
<td>History of Economic Thought</td>
<td>3</td>
</tr>
<tr>
<td>ECON 405</td>
<td>Bank Regulation</td>
<td>3</td>
</tr>
<tr>
<td>ECON 409</td>
<td>Current Issues in Macroeconomic Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 15
ECON 410 Empirical Methods in Economics I 3
ECON 411 Economic Forecasting 3
ECON 414 Managerial Economics 3
ECON 416 Mathematics for Economists 3
ECON 420 Economic Education 3
ECON 438 International Money and Finance 3
ECON 495 Readings in Economics 1-3
ECON 496 Research in Economics 1-3

Courses

ECON 105. Elements of Economics. 3 Credits.
Survey of Economic principles for students planning no further formal study of Economics. Analysis of factors influencing aggregate levels of output, employment, and prices; introduction to U.S. monetary system; price determination and resource allocation under competitive and monopolistic conditions. Review of selected contemporary economic issues. (No credit if Economics 201-202. Principles of Microeconomics and Macroeconomics, have been completed or audited. Not available to students in the College of Business and Public Administration.). Prerequisite: Not available to students in the College of Business and Public Administration. F.S.

ECON 201. Principles of Microeconomics. 3 Credits.
Nature, method, and scope of Economic analysis: economic scarcity, resources, specialization and division of labor, supply and demand, production and cost, technology, product and resource market structures, distribution of income, and international trade. Prerequisite or Corequisite: MATH 103 or MATH 146 or MATH 165 or MATH 166. F.S.

ECON 202. Principles of Macroeconomics. 3 Credits.
Nature, method, and scope of economic analysis: aggregate levels of income and employment, inflation, monetary and fiscal policy, the role of the U.S. economy as part of a world economic system. Prerequisite: ECON 201. F.S.

ECON 206. Survey of Economic Principles: Micro-Macro. 4 Credits.
Accelerated course in economic principles intended for students pursuing the MBA graduate degree. This course considers both micro and macro topics. Micro topics include: Economics and Economic Reasoning; The Economic Organization of Society; Supply-Demand Analysis; Elasticity; Individual Choice; Production and Cost Analysis; and Market Structures. Macro topics include: National Income Accounting; Economic Growth, Business Cycles and Inflation; Fiscal Policy; Monetary Economics; Monetary Policy; and the World Economy. Prerequisite: Consent of instructor. On demand.

ECON 210. Introduction to Business and Economic Statistics. 3 Credits.
Descriptive statistics; probability distributions; sampling distributions; statistical inference for means and proportions; hypothesis testing; simple regression and correlation; non-parametric statistics. Prerequisite: MATH 103 or MATH 146 or MATH 165 or MATH 166. F,S.

ECON 216. Mathematics and Statistics for MBA Students. 3 Credits.
To provide knowledge in mathematics and statistics needed for students in the MBA program. Topics include, among others, linear and quadratic functions, logarithmic and exponential functions, matrix algebra, limits, derivatives, linear and nonlinear programming, descriptive statistics, data collection, sampling, probability, estimation, hypothesis testing, statistical inference, and linear regression. Prerequisite: Approval of MBA director. SS.

ECON 303. Money and Banking. 3 Credits.
Nature of our current Monetary system; functional analysis of commercial bank operations; limits to credit expansion; alternative theories of the value of money; monetary and fiscal policies for control of the business cycle; powers of the Federal Reserve System and the Treasury; mechanics of international payment; balance-of-payments and other problems. Prerequisites: ECON 201 and ECON 202. F.S.

ECON 305. Principles of Banking I. 3 Credits.
This course introduces the students to basic principles of banking governing loans, investments, deposits, liabilities, and capital. Consideration is given to the areas of liquidity, profitability, and capital adequacy as they relate to regulatory standards. Additional topics include bank organization, performance, and scope of services. Prerequisite: ECON 303. F.

ECON 306. Principles of Banking II. 3 Credits.
A continuation of ECON 305. Principles of Banking I. Students will explore the application of theory to the financial decision making and management of banks. The main focus of the course is the assessment of bank risks and management of those risks. A feature of the course is the use of a bank simulation model to connect theory and practice. Prerequisite: ECON 305. S.

ECON 308. Intermediate Microeconomic Theory. 3 Credits.
Theory of demand, production, and cost; price determination under alternative market structures; general equilibrium and economic welfare; analysis of market failure; applications to public policy. (Core requirement for students planning advanced study in Economics.). Prerequisites: ECON 201 and ECON 202. F.

ECON 309. Intermediate Macroeconomic Theory and Policy. 3 Credits.
A framework for studying national income, employment, and the general price level is developed. Theoretical perspectives on the National Income and Product accounts, expenditures in the public and private sectors of the economy, and supply and demand for money, labor and other resources are surveyed. Macroeconomic Theory is then applied to a study of monetary, fiscal, incomes, and other policies intended to influence unemployment, inflation, balance of international financial payments, and economic growth. (Core requirement for students planning advanced study in Economics.). Prerequisites: ECON 201 and ECON 202. S.

ECON 324. Public Finance. 3 Credits.
Growth and effects of the public sector of the economy emphasizing effects of taxation and spending or borrowing and debt management on efficiency and use of economic resources. Prerequisites: ECON 201 and ECON 202.

ECON 330. Business and Economic History. 3 Credits.
An analysis of the growth and development of the American economy since its colonial origins. The framework of economic analysis applied to the patterns and trends. Specific topics include industrialization, capital accumulations, financial innovation, technological change, banking, the Great Depression and effects of entrepreneurial and government decisions. Prerequisites: ECON 105 or ECON 201 or ECON 202. F.

ECON 338. International Economics. 3 Credits.
Economic basis for gain in international trade; capital and population movements; international disequilibrium and the process of balance-of-payments adjustments; tariffs, underdeveloped countries. Prerequisites: ECON 201 and ECON 202. F,S.

ECON 341. Labor Economics and Labor Relations. 3 Credits.
A survey of the nature and causes of the economic problems of the American wage and salary earner and of the attempts of wage earners and society, through organizations and legislation, to alleviate these problems. The course comparatively surveys the history and systematic theories of labor movements and the market and institutional influences on wages and employment. Particular emphasis will be placed on the law of industrial relations, employment and income access, and the adjustment of labor disputes. Prerequisites: ECON 201 and ECON 202. F.

ECON 355. Government Regulation of Business. 3 Credits.
An exploration of the many ways that federal and state governments regulate business activity. Government regulation falls into three broad areas: economic regulation; social regulation; antitrust laws. The historical development of regulation, from both a legal and economic perspective, will be discussed. Particular attention will be paid to the current trend toward deregulation of previously regulated industries such as airlines, telecommunications, and trucking. Prerequisites: ECON 201 and ECON 202. F.

ECON 380. Global Economic Development. 3 Credits.
This course focuses on economic development issues at the global level. It covers both developing countries in the conventional sense and economies in transition from socialism to a market economy. In this context development is broadly defined as the transition from one stage of development to another. Selected topics common among these countries (such as determinants of growth, modernization, technology, price liberalization, privatization, macro stabilization, trade policies, legal structure, organized crime, inequality, poverty, human capital, and global sustainability) are discussed to better understand the forces that shape the wealth and well being of nations and people in the world around us. Prerequisites: ECON 201 and ECON 202. On demand.

ECON 395. Special Topics in Economics. 1-3 Credits.
Specific topic will vary from year to year; some years an important development in economic theory, other years, a significant issue in economic policy. Repeatable to 20 credits. Prerequisites: ECON 201 and ECON 202. Repeatable to 20 credits. On demand.
ECON 397. Cooperative Education. 1-4 Credits.
A practical work experience with an employer closely associated with the student's academic area. Repeatable to 6 credits. Prerequisite: Permission of departmental Cooperative Education Coordinator. Repeatable to 6 credits. S/U grading. F,S.

ECON 400. History of Economic Thought. 3 Credits.
Broad overview of the major schools of thought including Mercantilist, Physiocrat, Classical, Marxian, Socialist, Historical, Austrian, Neoclassical, Institutional, Keynesian, and Monetarist. The coverage includes value theory, income/expenditure theory, growth/development theory, scientific method, scope and public policy. Prerequisites: ECON 105 or ECON 201, and ECON 202. S.

ECON 405. Bank Regulation. 3 Credits.
The regulations imposed upon the banking industry are examined at several levels: state, federal, and global. Both the historical development of banking regulation as well as current issues/controversies are discussed. In addition, the banker's perspective of regulatory compliance is explored. Prerequisite: ECON 303. S.

ECON 409. Current Issues in Macroeconomic Policy. 3 Credits.
This course focuses on the conduct of macroeconomic policy, especially as it pertains to the operations and functions of the nation's financial system. The two basic tools of macroeconomic policy - monetary policy and fiscal policy - are studied from historical, contemporary, and theoretical perspectives. Emphasis is placed on recent developments in the theory and practice of macroeconomic policy; special emphasis is placed on the role of monetary policy as it affects the operations of financial markets and financial institutions. Prerequisite: ECON 303. S.

ECON 410. Empirical Methods in Economics I. 3 Credits.
This course is an introduction to econometrics, the joint area of economics and statistics dealing with the application of statistics to economic problems. The course objectives are to acquire a basic understanding of the theory and methods of econometrics and to gain practical experience in utilizing these methods. The students will use the tools developed in the course in homework and written assignments so that they can develop an insight to theory and its application. Prerequisites: ECON 201, ECON 202 and ECON 210. F.

ECON 411. Economic Forecasting. 3 Credits.
An introduction to Economics Forecasting and Time Series Analysis. The course will cover specifications and estimation of ARMA models, seasonality, non-stationarity, unit roots and forecast evaluations. Empirical applications are used throughout the course. Prerequisite: ECON 410 or ECON 506. S.

ECON 414. Managerial Economics. 3 Credits.
A synthesis relating economic theory, statistics, and mathematics to pricing, output, and resource allocation decisions by business firms. Prerequisites: ECON 210 and ECON 308; MATH 146 or equivalent; ISBC 117 or equivalent. S.

ECON 416. Mathematics for Economists. 3 Credits.
Study of mathematical methods in the areas of introductory calculus and linear algebra, and their application to economic analysis. Mathematical analysis of static and dynamic equilibrium models, growth models, distribution, production functions, cycles, activity analysis, mathematical programming, and model building. Prerequisites: ECON 308 and ECON 309; MATH 146 or MATH 165. On demand.

ECON 420. Economic Education. 3 Credits.
Designed for students planning to teach secondary social studies. Curriculum materials and methods of teaching economics; techniques for integrating economics into social studies curriculum. Prerequisites: ECON 105 or equivalent. On demand.

ECON 438. International Money and Finance. 3 Credits.
Identification of key international financial concepts and analysis of their relationships in the international money and capital markets; determination of the balance of payments and exchange rates; and examination of alternative organizations of the international monetary system. Prerequisite: ECON 303. F.

ECON 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F,S.S.S.

ECON 495. Readings in Economics. 1-3 Credits.
Extensive reading in the student's field of specialization; conference arranged with the instructor; written reports to be submitted. Repeatable to 3 credits. F,S.S.S.

ECON 496. Research in Economics. 1-3 Credits.
Research work and use of original documents; collecting of material and preparing of special topics and bibliographies; familiarizing the student with government publications and other material available for study of economic problems. F.S.S.S.

ECON 497. Internship. 1-4 Credits.
An internship is designed to provide the student with an opportunity for participating in a supervised work experience directly related to the field of training. Student will work closely with faculty adviser in planning the internship with an approved cooperating institution. Prerequisite: Permission of Department Committee on Internships. S/U grading. F,S.S.S.

Education and Human Development (EHD)
http://education.und.edu/

Courses

EHD 200. Research in the University Library. 1 Credit.
Introduction to effective library-based research. Current technologies and traditional methods are emphasized. F.S.

EHD 250A. Special Topics. 1-3 Credits.
Specially arranged seminars or courses on contemporary topics not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. 1 to 3 credits in any one semester; repeatable to 12 credits. Regular grading. Repeatable to 12 credits. F,S.

EHD 250B. Special Topics. 1-3 Credits.
Specially arranged seminars or courses on contemporary topics not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. 1 to 3 credits in any one semester; repeatable to 12 credits. S/U grading. Repeatable to 12 credits. S/U grading. F,S.

EHD 390A. Special Topics. 1-2 Credits.
May be repeated to 12 credits. Regular grading. Repeatable to 12 credits. S/U grading.

EHD 390B. Special Topics. 1-2 Credits.
May be repeated to 12 credits. S/U grading. Repeatable to 12 credits. S/U grading.

EHD 495A. Special Problems. 1-3 Credits.
Specially arranged seminars or courses on contemporary topics, having professional orientation and possible prerequisites not covered by regular departmental offerings. May be initiated by the students with approval of dean and department involved, provided appropriate faculty are willing. 1 to 3 credits in any one semester; repeatable to 12 credits. Regular grading. F,S.

EHD 495B. Special Problems. 1-3 Credits.
Specially arranged seminars or courses on contemporary topics, having professional orientation and possible prerequisites not covered by regular departmental offerings. May be initiated by the students with approval of dean and department involved, provided appropriate faculty are willing. 1 to 3 credits in any one semester; repeatable to 12 credits. S/U grading. S/U grading. F,S.

EHD 497. Community Concepts of Residence Hall Living. 2 Credits.
Assists Resident Assistants in gaining a more complete understanding of components of a successful residence hall environment with implications for job satisfaction and individual development. F,S.

Educational Leadership (EDL)
http://education.und.edu/educational-leadership/index.cfm

Courses

EDL 210. Exploring Leadership. 2 Credits.
This course offers students an opportunity to explore leadership in the university and community through a variety of perspectives. As a framework to explore leadership concepts, the course focuses on the consciousness of self, congruence, commitment, critical thinking, and communication as factors that contribute to leadership development. F.
EDL 211. Leadership Skills & Techniques. 3 Credits.  
This course explores both the theoretical concepts and application of leadership from a standpoint of the self, groups, and the community. Framed within the context of the university and surrounding educational communities, students engage in skill development and technique building exercises through experiential activities including a service learning project. F.  
EDL 299. Special Topics in Educational Leadership. 1-3 Credits.  
This course explores a special topic that is not regularly included in the available course offerings such as a current issue or concept. The primary focus of the class may vary year-to-year. Repeatable to 3 credits. Repeatable to 3 credits. F.S.  

Electrical Engineering (EE)  
http://www.engineering.und.edu/electrical  

Faruque, Fazel-Rezai, Kaabouch, Lindseth, Mardani, Mihelich, Nghanian, Ranganathan, Salehfer, and Tavakolian  
The mission of the department is to educate, inspire, and enhance the competitiveness of our graduates through integration of teaching and collaborative research focused on scientific innovation and discovery.  

Electrical Engineering Department provides campus and distance students with a strong foundation in the traditional and contemporary areas of electrical engineering, and help its graduates learn the leadership, communication, multidisciplinary teamwork, entrepreneurial, and life-long learning skills necessary for success in a global marketplace. The program provides students with the knowledge and opportunities that prepare them for industry and to pursue further education at the graduate level. The program also provides distance students with an opportunity to advance their careers as practicing engineers or managers. The essential studies component of the undergraduate program emphasizes the arts, humanities, and social sciences to provide breadth in education and well-rounded graduates.  

The Bachelor of Science in Electrical Engineering (B.S.E.E.) program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. Program educational objectives are based on the needs of the program’s constituencies.  
1. Graduates successfully practice electrical engineering and related fields regionally, nationally, and internationally.  
2. Graduates are well-prepared in the fundamental concepts of electrical engineering and continuously pursue professional development.  
3. Graduates are skilled in communication and teamwork, capable of functioning effectively, responsibly and ethically in diverse and global work environments.  
4. Graduates succeed in further graduate and professional studies.  

The B.S.E.E. program outcomes represent the abilities, knowledge, and objectives are based on the needs of the program’s constituencies.  
1. Graduates successfully practice electrical engineering and related fields regionally, nationally, and internationally.  
2. Graduates are well-prepared in the fundamental concepts of electrical engineering and continuously pursue professional development.  
3. Graduates are skilled in communication and teamwork, capable of functioning effectively, responsibly and ethically in diverse and global work environments.  
4. Graduates succeed in further graduate and professional studies.  

The B.S.E.E. program outcomes represent the abilities, knowledge, and understanding that the program is preparing its students to acquire immediately upon graduation from the University of North Dakota (identical to Engineering Accreditation Commission of ABET outcomes (a) through (k)):  
(a) an ability to apply knowledge of mathematics, science, and engineering  
(b) an ability to design and conduct experiments, as well as to analyze and interpret data  
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability  
(d) an ability to function on multidisciplinary teams  
(e) an ability to identify, formulate, and solve engineering problems  
(f) an understanding of professional and ethical responsibility  
(g) an ability to communicate effectively  
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context  
(i) a recognition of the need for, and an ability to engage in life-long learning  
(j) a knowledge of contemporary issues  
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice  

The department is committed to fostering a close student-faculty educational environment that facilitates competence, self-development, and self-confidence. This commitment extends to providing an excellent undergraduate electrical engineering program that encompasses both breadth and depth. The technical and essential studies components of the curriculum provide the students with opportunities for achieving technical competence and awareness of economic and ethical responsibilities. The technical curriculum includes:  
1. basic engineering science;  
2. traditional electrical engineering areas, such as linear electric circuits, analog/digital electronics, computer-aided design, control systems, electric energy conversion, electric and magnetic fields, and embedded systems;  
3. electives, by which junior- and senior-level students may select courses with a focus on a particular subject or related subjects in electrical engineering. Some areas of concentration of elective courses include applied electromagnetics, biomedical engineering, control systems, signal processing, embedded systems design, wireless communications, antennas and microwave engineering, renewable energy systems, smart grid and cyber security.  

To prepare students for engineering practice, design and hands-on experience are emphasized throughout the curriculum and supported by diverse laboratory facilities to implement hardware and software prototypes. Students are introduced to subject-related computer-aided design tools in a number of required and elective courses in preparation for a capstone senior design experience. Every student is required to complete a comprehensive design project over their senior year. Computer applications, statistical methods, and written, oral, and interpersonal communication skills are emphasized across the curriculum, along with opportunities to enhance teamwork and life-long learning skills. Cooperative education is encouraged to enhance students’ technical development, communication, and multidisciplinary teamwork skills, in addition to fostering an understanding of global engineering practice. Students are encouraged to promote the profession and develop leadership skills through involvement in honorary and professional student organizations, as well as through participation in extracurricular research and design projects.  

The department has a strong student advising program, which facilitates individual contact with students to help them make sound academic decisions and to understand the purpose of their education and chosen profession. Additionally, relatively small class sizes help our electrical engineering students and faculty truly get to know one another, resulting in a personalized educational experience.  

The B.S.E.E. program is delivered face-to-face to campus students, as well as over the Internet via digitally-recorded lectures to distance students. The Distance Engineering Degree Program (DEDP) is offered to students around the world, in which the distance students receive an equivalent educational experience as compared to their campus counterparts. DEDP students enroll in the same required and elective lecture courses during the regular academic year as the campus students by watching digitally-recorded lectures delivered over the Internet, but they are required to travel to campus during the summer months to complete some parts of accelerated laboratory sections. Academic advising, assistance from faculty, and the capstone senior design experience are fundamentally the same for both campus and distance students.  

To allow qualified students to complete a graduate degree in approximately one year beyond that required to receive the baccalaureate degree alone, the department offers combined B.S.E.E./Master of Science (M.S.) in Electrical Engineering and B.S.E.E./Master of Engineering (M.Engr.) degrees. See Combined Degree Program under the College of Engineering and Mines (p. 618) for more details.  

In addition to the traditional B.S. in Electrical Engineering program that emphasizes the analysis and design of circuits and systems, the department offers three interdisciplinary focus areas to undergraduate students with interests in aerospace, biomedical engineering, and computer science. All four curricula are listed in their entirety as follows:
B.S. in Electrical Engineering with an Aerospace Focus (p. ) B.S. in Electrical Engineering with a Biomedical Engineering Focus (p. ) B.S. in Electrical Engineering with a Computer Science Focus (p. )

College of Engineering and Mines

B.S. in Electrical Engineering

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. The University’s Essential Studies Breadth of Knowledge, Social-Cultural Diversity, and Special Emphasis Requirements (refer to the online Academic Catalog for a listing of acceptable Essential Studies courses).

II. The Following Curriculum:

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121 General Chemistry I</td>
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<td>CHEM 121L General Chemistry I Lab</td>
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<tr>
<td>EE 101 Introduction to EE</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
<td>MATH 165 Calculus I</td>
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</tr>
<tr>
<td>Social Sciences Elective (SS)</td>
<td>3</td>
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<tr>
<td>Humanities Elective (A&amp;H)</td>
<td>3</td>
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<tr>
<td><strong>Credits</strong></td>
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Second Semester

<table>
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<tbody>
<tr>
<td>EE 201 Introduction to Digital Elec</td>
<td>2</td>
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<tr>
<td>EE 201L Digital Electronics Lab</td>
<td>1</td>
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<tr>
<td>MATH 166 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251 University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>Fine Arts Elective (A&amp;H)</td>
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<td>A&amp;H or SS Elective (A&amp;H)</td>
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<tr>
<td><strong>Credits</strong></td>
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Sophomore Year

<table>
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<tr>
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<tbody>
<tr>
<td>EE 206 Circuit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EE 206L Circuits Lab II</td>
<td>1</td>
</tr>
<tr>
<td>EE 304 Computer Aided Measurement</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130 Composition II</td>
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<tr>
<td>MATH 265 Calculus III</td>
<td>4</td>
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<tr>
<td>PHYS 252 University Physics II</td>
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<tr>
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Second Semester

<table>
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<tbody>
<tr>
<td>EE 313 Linear Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EE 313L Circuits Lab II</td>
<td>1</td>
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<tr>
<td>ENGR 460 Engineering Economy</td>
<td>3</td>
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<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
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<td>Non EE Elective</td>
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Junior Year

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>EE 314 Signals and Systems</td>
<td>3</td>
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<tr>
<td>EE 314L Signal and Systems Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE 316 Electric and Magnetic Fields</td>
<td>3</td>
</tr>
<tr>
<td>EE 318 Engineering Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EE 321 Electronics I</td>
<td>3</td>
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<td>EE 321L Electronics Lab</td>
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<td><strong>Credits</strong></td>
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Second Semester

<table>
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<tr>
<td>EE 401 Electric Drives</td>
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<td>EE 401L Electric Drives Lab</td>
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<tr>
<td>EE 405 Control Systems I</td>
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<td>EE 409 Distributed Networks</td>
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<td>EE 421 Electronics II</td>
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<tr>
<td>EE 452 Embedded Systems</td>
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<tr>
<td>EE 452L Embedded Systems Design Lab</td>
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<td><strong>Credits</strong></td>
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Senior Year

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
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<tr>
<td>Non-EE Elective</td>
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<td>Electrical Engineering Elective 7</td>
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<tr>
<td>Ethics Elective (A&amp;H or SS)</td>
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1. May be waived for transfer students (substitute science credit required).
2. To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts & Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies courses.
3. To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.
5. EE 480 Senior Design I meets the Essential Studies Special Emphasis requirement for Advanced Communication (A) and Senior Capstone (C). Senior standing with approval of adviser. Prerequisites: EE 421 and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.
6. EE 481 Senior Design II meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
7. Maximum of three credits of EE 490 Advanced EE Problems allowed as an independent study, applicable to both EE and non EE electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.
8. The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts & Humanities or the Social Sciences. Ethics Elective choices: PHIL 250 Ethics in Engineering and Science (A&H, Humanities); CHE 340 Professional Integrity in Engineering (SS); and ME 370 Engineering Disasters and Ethics (SS).

Some of the following courses may be waived by completing: ENGR 102
### B.S. in Electrical Engineering with an Aerospace Focus

Required 129 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. The University’s Essential Studies Breadth of Knowledge, Social-Cultural Diversity, and Special Emphasis Requirements (refer to the online Academic Catalog for a listing of acceptable Essential Studies courses).

II. The Following Curriculum

#### Freshman Year

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<tr>
<th>First Semester</th>
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<tbody>
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#### Second Semester

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#### Sophomore Year

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<td>PHYS 252</td>
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#### Second Semester

<table>
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<td>MATH 207</td>
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#### Junior Year

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#### Second Semester

<table>
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<table>
<thead>
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<td>EE 405</td>
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### Senior Year

#### First Semester

<table>
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<tr>
<td>Aviation Elective</td>
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<td>Electrical Engineering Elective</td>
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<tr>
<td>Non-EE Elective</td>
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<td>A&amp;H or SS Elective</td>
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#### Second Semester

<table>
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<tr>
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<table>
<thead>
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<th>First Semester</th>
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<tbody>
<tr>
<td>EE 481</td>
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<tr>
<td>Aviation Elective</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<tr>
<td>Ethics Elective (A&amp;H or SS)</td>
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### Credits

<table>
<thead>
<tr>
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III- Grade of "C" or better in all EE courses required for graduation.

1. May be waived for transfer students (substitute science credit required).
2. To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts & Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies courses.
3. To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.
5. Senior Standing with approval of advisor. EE 480 Senior Design I meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). EE 480 Prerequisites: EE 421 and EE 421L, and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.
6. EE 481 Senior Design II meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
7. Maximum of three credits of EE 490 Advanced EE Problems allowed as an independent study, applicable to both EE and non-EE Electives. 1-2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective. The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts & Humanities or the Social Sciences. Ethics Elective choices: Phil 250 Ethics in Engineering & Science (A&H, Humanities), ChE 340 The Role of Engineers and Applied Scientists in a Global Society (SS), and ME 370 Engineering Disasters & Ethics (SS).

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**University of North Dakota**
B.S. in Electrical Engineering with a Biomedical Engineering Focus

Required 128 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. The University’s Essential Studies Breadth of Knowledge, Social-Cultural Diversity, and Special Emphasis Requirements (refer to the online Academic Catalog for a listing of acceptable Essential Studies courses).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>BIOL 150 General Biology I</td>
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<tr>
<td>CHEM 121 General Chemistry I</td>
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<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
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<tr>
<td>EE 101 Introduction to Electrical Engineering</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
<td>MATH 165 Calculus I</td>
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<tr>
<td><strong>Total Credits</strong></td>
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| Second Semester                                    |         |
| BIOL 151 General Biology II                        | 3       |
| BIOL 151L General Biology II Laboratory            | 1       |
| EE 201 Introduction to Digital Electronics         | 2       |
| EE 201L Digital Electronics Laboratory             | 1       |
| MATH 166 Calculus II                               | 4       |
| PHYS 251 University Physics I                       | 4       |
| **Total Credits**                                  | **15**  |

| Sophomore Year                                     |         |
| First Semester                                     |         |
| EE 206 Circuit Analysis                            | 3       |
| EE 206L Circuits Laboratory I                      | 1       |
| EE 304 Computer Aided Measurement and Controls      | 3       |
| ENGL 130 Composition II: Writing for Public Audiences | 3     |
| MATH 265 Calculus II                               | 4       |
| PHYS 252 University Physics II                     | 4       |
| **Total Credits**                                  | **18**  |

| Second Semester                                    |         |
| ANAT 204 Anatomy for Paramedical Personnel         | 3       |
| EE 313 Linear Electric Circuits                    | 3       |
| EE 313L Circuits Laboratory II                     | 1       |
| ENGR 460 Engineering Economy(SS)                   | 3       |
| MATH 266 Elementary Differential Equations         | 3       |
| PSYC 111 Introduction to Psychology or SOC 110     | 3       |
| **Total Credits**                                  | **16**  |

| Junior Year                                         |         |
| First Semester                                     |         |
| EE 314 Signals and Systems                         | 3       |
| EE 314L Signal and Systems Laboratory              | 1       |
| EE 316 Electric and Magnetic Fields                | 3       |
| EE 318 Engineering Data Analysis                   | 3       |
| EE 321 Electronics I                               | 3       |
| EE 321L Electronics Laboratory I                   | 1       |
| PPT 301 Human Physiology                           | 4       |
| **Total Credits**                                  | **18**  |

| Second Semester                                    |         |
| EE 405 Control Systems I                            | 3       |
| EE 405L Control Systems Laboratory                  | 1       |
| EE 409 Distributed Networks                         | 3       |
| EE 421 Electronics II                               | 3       |
| **Total Credits**                                  | **15**  |

| Senior Year                                         |         |
| First Semester                                     |         |
| EE 480 Senior Design I                              | 5       |
| Electrical Engineering Elective 7                   | 3       |
| Electrical Engineering Elective 7                   | 3       |
| Humanities (A&H) 2, 3                               | 3       |
| Fine Arts Elective (A&H) 2, 3                       | 3       |
| **Total Credits**                                  | **15**  |

| Second Semester                                    |         |
| EE 481 Senior Design II                             | 6       |
| Electrical Engineering Elective 7                   | 3       |
| Non-EE Elective 4                                   | 3       |
| Ethics Elective (A&H or SS) 2, 3                    | 3       |
| A&H or SS Elective 2, 3                            | 3       |
| **Total Credits**                                  | **15**  |

**Additional Recommended Pre-Medical Courses**

<table>
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<tr>
<th>Course</th>
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<tr>
<td>ANAT 204L Anatomy for Paramedical Personnel</td>
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<tr>
<td>BIOL 315 Genetics</td>
<td>3</td>
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<tr>
<td>BIOL 369 Histology</td>
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</tr>
<tr>
<td>CHEM 434L Organic Chemistry I Laboratory</td>
<td>3</td>
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<tr>
<td>CHEM 434L Organic Chemistry I Laboratory</td>
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<td>CHEM 432L Organic Chemistry II Laboratory</td>
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<tr>
<td>MBIO 302 General Microbiology Lecture</td>
<td>2</td>
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<tr>
<td>MBIO 302L General Microbiology Laboratory</td>
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</table>

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3. To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.
5. EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). EE 480 Prerequisites: EE 421L and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.
6. EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
I. The University’s Essential Studies Breadth of Knowledge, Social-Cultural Diversity, and Special Emphasis Requirements (refer to the online Academic Catalog for a listing of acceptable Essential Studies courses).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>CHEM 121 General Chemistry I</td>
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<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
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<tr>
<td>CSCI 130 Introduction to Scientific Programming</td>
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<tr>
<td>or CSCI 160 Computer Science I</td>
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<tr>
<td>EE 101 Introduction to Electrical Engineering</td>
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<tr>
<td>ENGL 110 College Composition I</td>
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<td>MATH 165 Calculus I</td>
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<td>Humanities Elective (A&amp;H)</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>CSCI 161 Computer Science II</td>
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<tr>
<td>EE 201 Introduction to Digital Electronics</td>
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<td>EE 201L Digital Electronics Laboratory</td>
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<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<td>EE 304 Computer Aided Measurement and Controls</td>
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<td>MATH 265 Calculus III</td>
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<td>PHYS 251 University Physics I</td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>EE 313 Linear Electric Circuits</td>
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<td>EE 313L Circuits Laboratory II</td>
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<td>ENGR 460 Engineering Economy</td>
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<td>MATH 208 Discrete Mathematics</td>
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<td>MATH 266 Elementary Differential Equations</td>
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<td>PHYS 252 University Physics II</td>
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<tr>
<td><strong>Junior Year</strong></td>
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<tr>
<td>EE 314 Signals and Systems</td>
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III. Grade of "C" or better in all EE courses required for graduation.

### Electrical Engineering Elective

- EE 316 Electric and Magnetic Fields
- EE 321 Electronics I
- EE 321L Electronics Laboratory I
- EE 451 Computer Hardware Organization

### Second Semester

**Second Semester**
- EE 405 Control Systems I
- EE 405L Control Systems Laboratory
- EE 409 Distributed Networks
- EE 421 Electronics II
- EE 421L Electronics Lab II
- EE 452 Embedded Systems
- EE 452L Embedded Systems Design Laboratory

**Credits**  15

---

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4. EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). EE 480 Prerequisites: EE 421 and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.
5. EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O)
6. Maximum of three credits of EE 490 Electrical Engineering Problems, allowed as an independent study, applicable to both EE and non-EE Electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.
7. The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts & Humanities or the Social Sciences. Ethics Elective choices: PHIL 250 Ethics in Engineering and Science (A&H, Humanities); PHIL 251 Ethics in Health Care (A&H, Humanities); CHE 340 Professional Integrity in Engineering (SS); and ME 370 Engineering Disasters and Ethics (SS).
8. Computer Science Elective choices: Any Computer Science course, 300 level or higher. A maximum of three credits of CSCI 260 Advanced Programming Languages, is permitted.
Minor in Aviation - Professional Flight

Required: 8 Aviation credit hours from the B.S.E.E. Aerospace Focus Program, choose Avit 324 and Avit 325 for 5 credit hours of Aviation Elective, plus the following 17 additional credits (total of 30 credit hours):

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<td>ATSC 231</td>
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<td>AVIT 208</td>
<td>Aviation Safety</td>
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<td>AVIT 222</td>
<td>IFR Regulations and Procedures</td>
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<td>AVIT 323</td>
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<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Minor in Biomedical Engineering

Open to Electrical Engineering majors only.

For the B.S.E.E. Biomedical Engineering (BME) minor, the following courses need to be completed in addition to major B.S.E.E. courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 151L</td>
<td>General Biology II Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>One of these two courses (accepted as Social Science Elective):</strong></td>
<td>3</td>
</tr>
<tr>
<td>PSYG 111</td>
<td>Introduction to Psychology</td>
<td></td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Two of the three courses (accepted as Electrical Engineering or Technical Electives):</strong></td>
<td>6</td>
</tr>
<tr>
<td>EE 490</td>
<td>Electrical Engineering Problems</td>
<td></td>
</tr>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td></td>
</tr>
<tr>
<td>EE 550</td>
<td>Biomedical Instrumentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

Courses

**EE 101. Introduction to Electrical Engineering. 1 Credit.**

An introduction to the electrical engineering discipline. Recent technologies and practices in electronics, computers, controls, power systems, robotics, communication, and microwaves. F.S.

**EE 201. Introduction to Digital Electronics. 2 Credits.**

Introduction to the fundamentals of digital circuits design. Logic gates; Boolean algebra; Karnaugh maps; Mathematical operations; Flip Flops; Counters. Corequisite: EE 202. F.S.

**EE 201L. Digital Electronics Laboratory. 1 Credit.**

Introduction to design and implementation of digital electronic circuits. Corequisite: EE 201. F.S.

**EE 206. Circuit Analysis. 3 Credits.**

Introduces the foundations of electrical engineering, applying these concepts in developing the fundamentals of energy conversion, electronics and circuit theory. Prerequisite: MATH 165 with a grade of C or better; EE Major should be declared. F.

**EE 206L. Circuits Laboratory I. 1 Credit.**

Introduction to methods of experimental circuit analysis and to proper uses of laboratory equipment. Prerequisite: EE major should be declared. Corequisite: EE 206. F.SS.

**EE 304. Computer Aided Measurement and Controls. 3 Credits.**

The principles of the use of a computer in a measurement and control environment are presented. Software is designed to drive interfaces to perform measurement and control algorithms. The software and concepts presented are evaluated in a laboratory environment. Prerequisites: Electrical Engineering major and MATH 165. F.

**EE 313. Linear Electric Circuits. 3 Credits.**

Linear electric circuits in the steady state and transient conditions; two-port circuits; Fourier Series single and polyphase systems. Prerequisites: Electrical Engineering major and EE 206 with a grade of C or better. Corequisite: EE 313L. S.

**EE 313L. Circuits Laboratory II. 1 Credit.**

Experimental circuit analysis and proper uses of laboratory equipment. Prerequisites: Electrical Engineering major and EE 206L. Corequisite: EE 313. S,SS.

**EE 314. Signals and Systems. 3 Credits.**

Passive filters; Laplace transform applications; Fourier transform; Z-transform; Nyquist sampling theorem; other topics as time permits (state variables; introduction to control and communications theory; discrete Fourier transform). Prerequisite: EE 313. Corequisite: MATH 266. F.

**EE 314L. Signal and Systems Laboratory. 1 Credit.**

In this laboratory course, students will conduct simulations and experiments related to theory covered in EE 314. The topics include implementation of passive filters, Laplace transform, and z-transform. Corequisite: EE 314. F.

**EE 316. Electric and Magnetic Fields. 3 Credits.**

Field produced by simple distributions of electric charges and magnetic poles, field mapping and application to engineering problems. Prerequisites: EE 206 with a grade of C or better. Corequisite: MATH 266. F.

**EE 318. Engineering Data Analysis. 3 Credits.**

This course will provide undergraduate electrical engineering students with an understanding of the principles of engineering data analysis using basic probability theory and basic statistics theory. Students will have the opportunity to apply these concepts to actual engineering applications and case studies. Prerequisites: EE 206 with a grade of C or better. Corequisite: EE 313. F.

**EE 321. Electronics I. 3 Credits.**

Fundamentals of semiconductors, nonlinear discrete components such as diodes and transistors, and integrated circuits; analysis and synthesis of simple electronic circuits, including amplifiers. Prerequisite: EE 313. Corequisite: EE 321L. F.

**EE 321L. Electronics Laboratory I. 1 Credit.**

Practical electronics application and design using theory studied in concurrent third year electrical engineering courses. Prerequisite: EE 313L. Corequisite: EE 321. F.

**EE 397. Cooperative Education. 1-2 Credits.**

A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department, and employer. Repeatable to 24 credits. Prerequisite: Admission to the electrical engineering degree program; a cumulative GPA of 2.0 or higher is required. Repeatable to 24 credits. S/U grading. F.S,SS.

**EE 401. Electric Drives. 3 Credits.**

A study of variable speed drives and their electronic controls; analysis and synthesis of power electronics through computer simulations and laboratory implementations. Prerequisite: EE 314. S.

**EE 401L. Electric Drives Laboratory. 1 Credit.**

The course provides the basic knowledge required for the usage and the design of the most common electrical drives. This lab focuses on the Electric Drives and their control in a real time environment using dSPACE and/or similar digital signal processing based methods and simulations. Corequisite: EE 401. S.

**EE 405. Control Systems I. 3 Credits.**

Mathematical modeling and dynamic response of linear control systems; stability analysis; design of linear controllers using the root locus and frequency response techniques. Prerequisite: EE 314 and MATH 266. S.

**EE 405L. Control Systems Laboratory. 1 Credit.**

Experiments and simulations related to theory discussed in EE 405 are implemented in this laboratory course. The topics included mathematical modeling and dynamic response of linear systems; stability analysis; and design of controllers. Corequisite: EE 405. S.

**EE 409. Distributed Networks. 3 Credits.**

Fundamentals of transmission lines. Prerequisite: EE 313 and EE 316. S.

**EE 411. Communications Engineering. 3 Credits.**

Mathematical definition of random and deterministic signals and a study of various modulation systems. Prerequisite: EE 314. On demand.
EE 421. Electronics II. 3 Credits.
Analysis of electronic circuits and systems using discrete components and integrated circuits, digital circuits, active filters, and power amplifiers. Prerequisite: EE 314 and EE 321. Corequisite: EE 421L. S.

EE 421L. Electronics Lab II. 1 Credit.
Practical electronics application and design using theory studied in concurrent third-year electrical engineering courses. Prerequisite: EE 321L. Corequisite: EE 421. S.

EE 423. Power Systems I. 3 Credits.
Electric power systems operation, control and economic analysis. Prerequisite: EE 313. On demand.

EE 424. Electronic Circuits. 3 Credits.
Principles, applications, and design of electronic equipment studied from viewpoint of complete systems. Prerequisite: EE 321. On demand.

EE 428. Robotics Fundamentals. 3 Credits.
Fundamentals of robotic systems: modeling, analysis, design, planning, and control. The project provides hands-on experience with robotic systems. Prerequisite: MATH 266 or consent of instructor. On demand.

EE 430. Introduction to Antenna Engineering. 3 Credits.
Review of vector analysis and Maxwell's equations, wave propagation in unbounded regions, reflection and refraction of waves, fundamental antenna concepts, wire- and aperture-type antennas, wave and antenna polarization, antenna measurements, and computer-aided analysis. Prerequisite: EE 409 or consent of instructor. On demand.

EE 434. Microwave Engineering. 3 Credits.
Review of transmission lines and plane waves, analysis of microwave networks and components using scattering matrices, analysis of periodic structures, transmission and cavity type filters, high frequency effects, microwave oscillators, amplifiers, and microwave measurement techniques. Prerequisite: EE 409 or consent of instructor. On demand.

EE 451. Computer Hardware Organization. 3 Credits.
The study of complete computer systems including digital hardware interconnection and organization and various operation and control methods necessary for realizing digital computers and analog systems. Prerequisite: EE 201 and EE 304; or consent of instructor. On demand.

EE 452. Embedded Systems. 3 Credits.
A study of microcontroller hardware and software, with an emphasis on interfacing the microcontroller with external electronic devices such as transceivers, sensors, and actuators for communications and control within an embedded system. Prerequisite: EE 201, EE 304 and EE 321. S.

EE 452L. Embedded Systems Design Laboratory. 1 Credit.
This introductory laboratory course provides students with the hands-on activities in order to learn and gain more experiences in designing embedded systems (smart systems) using microcontrollers, actuators, and sensors. Prerequisites: EE 201 and EE 304 or consent of instructor. Prerequisite or corequisite: EE 452. S.

EE 456. Digital Image Processing. 3 Credits.
Digital image retrieval, modification, enhancement, restoration, and storage. Image transformation and computer vision. The associated laboratory provides hands-on experiences. Prerequisite: EE 304 and EE 314. On demand.

EE 480. Senior Design I. 3 Credits.
First course in the two-semester capstone design experience for the electrical engineering undergraduate degree, emphasizing design methodologies, advanced communication, and teamwork. Student teams will select an electronic system to design, capture end-user requirements, and perform component trade studies, resulting in an oral and written critical design review at the end of the semester. EE 480 Senior Design I meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). Prerequisites: EE 309 and EE 421 and two out of the four following classes: EE 401, EE 405, EE 409, EE 452. F.

EE 481. Senior Design II. 3 Credits.
Second course in the two-semester capstone design experience for the electrical engineering undergraduate degree, emphasizing design methodologies, oral communication, and teamwork. Student teams will be required to build and test a prototype of the electronic systems designed in EE 480 Senior Design I, and they will prepare written reports and deliver oral presentations on their design choices with critique by the instructor. EE 481 Senior Design II meets the Essential Studies Special Emphasis requirement for Oral Communication (O). Prerequisite: EE 480. S.

EE 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F,S,SS.

EE 490. Electrical Engineering Problems. 1-9 Credits.
Repeatable to maximum of 9 credits. Prerequisite: Approval by departmental faculty member under whom the electrical engineering problem is studied. Repeatable to 9 credits. F,S.

Engineering (Engr)
http://www.engineering.und.edu

Minor in Engineering Science

The Engineering Science minor is available to non-engineering students, and requires the completion of 20 credit hours of approved coursework, as detailed below with a cumulative GPA of 2.0 or above.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 101</td>
<td>Graphical Communication</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 202</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>or ENGR 203</td>
<td>Mechanics of Materials</td>
<td></td>
</tr>
<tr>
<td>ENGR 206</td>
<td>Fundamentals of Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 306</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>or ME 306</td>
<td>Fluid Mechanics</td>
<td></td>
</tr>
<tr>
<td>or ME 341</td>
<td>Thermodynamics</td>
<td></td>
</tr>
</tbody>
</table>

Electives Courses * 8

Total Credits 20

* Any regularly offered course at the 200 or higher level with the prefix Engr, ChE, EE, GE, ME or PE may be used as elective.

The minor program is administered through the CEM Dean’s Office.

Courses

ENGR 100. Introduction to Engineering. 1 Credit.
This course has been developed to provide undecided freshman in engineering with an introduction to the different engineering disciplines offered at the College of Engineering and Mines. The goal of this course is to enable undecided freshmen to make a more informed choice when choosing an engineering degree program. The course covers challenges and opportunities for emerging engineers. The overview is followed by discipline specific presentations and activities. Information about advising, career planning and placement, and information on student organizations will also be presented. S/U grading. F.

ENGR 101. Graphical Communication. 3 Credits.
Development of visualization, technical communication, and documentation skills. 3-D geometric modeling as applied to CAD/CAM applications using current methods and techniques commonly found in industry. Introduction to engineering, design and team problem solving. F,S.

ENGR 102. Professional Assessment and Evaluation. 1 Credit.
This course is designed for students with industrial experience. Students complete a portfolio documenting educational and work experiences for evaluation, and individualized curriculum plans are developed. Various academic programs in engineering are also introduced. Based on the assessment and evaluation, some engineering requirements may be waived. Prerequisites: Work experience and/or technician school training plus completion of Chemistry I, Physics I and II, and Calculus I, II, and III (see dept for approval). S/U grading.

ENGR 200. Computer Applications in Engineering. 2 Credits.
The fundamentals of digital computer programming are presented with special emphasis on a high-level language and engineering applications. The fundamentals of PC-based software applications and operating systems are also presented. F,S.

ENGR 201. Statics. 3 Credits.
ENGR 202. Dynamics. 3 Credits.
Simple particle and rigid body kinematics/kinetics. Vector approach to principles of dynamics. Newton's laws of motion, work-energy, and impulse-momentum principles for particle and rigid body motion. Prerequisite: ENGR 201 with a grade of C or better and MATH 166 with a grade of C or better. F,S,SS.

ENGR 203. Mechanics of Materials. 3 Credits.
Simple stress and strain, mechanical properties of materials, axial load, torsion, shear and bending moment, flexure and shear stresses in beams, combined stresses, stress transformation, statically indeterminate members and columns. Prerequisite: ENGR 201 with a grade of C or better or permission of the College of Engineering. F,S.

ENGR 206. Fundamentals of Electrical Engineering. 3 Credits.
The course introduces fundamental electrical engineering concepts, such as passive and active components (resistor, capacitor, inductor, operational amplifier, digital gates), circuit analysis (Ohm’s Law, KCL, KVL, phasors), energy, power and three-phase systems. The course includes laboratory experiments and computer simulations. Prerequisite: MATH 165; not open to Electrical Engineering majors. F,S.

ENGR 301. Technology and Innovation Case Studies. 3 Credits.
The qualities and attributes that lead to the successful development of new and innovative technologies will be presented in the form of case studies. This course will provide a basic understanding of the entrepreneurial process of innovation and technology-based venture creation. Effective leadership and entrepreneurial skills will be demonstrated. F.

ENGR 401. Engineering Leadership Seminar. 1 Credit.
This seminar course is taken by students participating in the CEM Leadership Development Program. Students will meet 4-6 times per semester to take part in workshops and activities conducted by the Jodsaas Center for Engineering Leadership and Entrepreneurship staff and invited speakers from industry. Topics will include leadership, management, business and entrepreneurship presented in an engineering context. Repeatable to 4 credits. F,S.

ENGR 410. Technology Ventures. 3 Credits.
The primary focus will be on developing techniques to formulate the strategic framework required to develop high-tech ventures. Successful techniques to take technology-intensive opportunities from concept to commercialization will be explored. S.

ENGR 460. Engineering Economy. 3 Credits.
Simple evaluation of the economic merits of alternative solutions to engineering problems. Evaluations emphasize the time value of money. F,S.

ENGR 490. Topics in Engineering. 1-3 Credits.
This course covers current engineering topics based on student and faculty interest. Student should check with their home department to determine whether it can be used to satisfy specific degree requirements. Prerequisite: Permission of Instructor. Repeatable to 9 credits. On demand.

English Language and Literature (Engl)

http://www.arts-sciences.und.edu/english

Alberts, Basgier, Beard, Carson, Dixon, Donehower, Flynn, Huang, Klizes, Koecke, Lining, Nelson, O’Donnell, Robison, Sauer, Weaver-Hightower, and Wolfe (Chair)

The English Major

Through the work of research, service, and teaching, the Department of English is committed to the premise that language and literature reflect and shape the world in which we live. Faculty members conduct ongoing research in an array of subfields and interdisciplinary contexts and contribute to academic conversations occurring among humanities scholars on national and international levels. The nationally renowned Writers Conference brings great authors and opportunities for literary discussion to the larger community. Teaching at a wide range of levels, from first-year writers to Ph.D. students, the Department demonstrates the pleasures and value of a liberal arts education by emphasizing critical and creative thinking, by helping students think carefully about cultural diversity, and by teaching strong written communication skills. In the Department of English, students at all levels of the curriculum are prepared for lives of public citizenship as they learn to analyze texts within complex cultural situations, to write and to think rhetorically, and to engage with diverse perspectives.

The Bachelor of Arts in English gives students strong reading, writing, and analytical skills, as well as an understanding of the broader cultural, historical, and literary contexts in which acts of reading and writing take place. The degree, therefore, is a foundation for the professions of Law and Medicine, and also for a range of careers in areas such as writing, teaching, publishing, new media, and business or nonprofit organizations.

While requirements for the major and suggested programs of study are described here, students are strongly encouraged to plan their major coursework in consultation with their English department advisers. Advisers can assist students in tailoring programs of study to students’ individual needs and plans.

B.A. with Major in English

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

Major Requirements—36 credits, 20 of which must be at the 300- or 400-level. The following courses are required:

ENGL 271 Reading and Writing about Texts 3
ENGL 272 Introduction to Literary Criticism 3
Select one of the following: 6
ENGL 301 Survey of English Literature I & ENGL 302 and Survey of English Literature II & ENGL 303 Survey of American Literature & ENGL 304 and Survey of American Literature Select one of the following: 3
ENGL 241 World Literature I
ENGL 301 Survey of English Literature I (in addition to 303-304)
ENGL 303 Survey of American Literature (in addition to 301-302)
ENGL 315 Shakespeare or ENGL 316 Shakespeare ENGL 401 Studies in Medieval Literature
ENGL 403 Studies in Colonial American Literature
ENGL 404 Studies in Renaissance Literature
ENGL 405 Studies in Restoration and Eighteenth Century Literature
ENGL 406 Studies in Nineteenth Century Literature
ENGL 415 Seminar in Literature (when topic is appropriate; consult your adviser)
Select two 400-level courses
Level II (two semesters) proficiency in a language other than English.

400-level courses require students to develop and complete significant independent research, writing, and/or professional projects.

Majors may complete the remaining English credits in any way they wish, with two stipulations:

- ENGL 423 Methods/Materials for Teaching Middle/Secondary English, the methods course for English Education majors, may not count towards the English major.
- Twenty credits of English major coursework must be at the 300/400 level.

The English Department encourages majors to take an active role in choosing courses that develop their individual interests and capacities. To help majors tailor course choices to specific interests, here are three sample plans that may help in designing a program of study beyond the major requirements:

Scenario One: You are interested in writing and publishing. Include courses from this list:

ENGL 226 Introduction to Creative Writing 3
ENGL 306 Creative Writing: Fiction 3
ENGL 307 Creative Writing: Poetry 3
ENGL 308 The Art of Writing Nonfiction 3
ENGL 408 Writing for Digital Environments 3
ENGL 413 The Art of Writing: Poetry 3
ENGL 414 The Art of Writing: Fiction 3

You may also consider pursuing a Certificate in Writing and Editing or taking any of the courses included in the Certificate:

ENGL 427 Scholarly Editing 3
ENGL 428 Digital Humanities 3
ENGL 429 Studies in Writing and Editing 3

Scenario Two: You would like to focus on linguistics (the study of language, including teaching English as a second language, computer languages, translation, etc.) Include courses from this list:

ENGL 209 Introduction to Linguistics 3
ENGL 309 Modern Grammar 3
ENGL 370 Language and Culture 3
ENGL 417 Special Topics in Language (topics rotate and may be repeated with different topics) 1-4
ENGL 418 Second Language Acquisition 3
ENGL 419 Teaching English as a Second Language 3
ENGL 442 History of the English Language 3

Note: Related language and linguistics courses are taught in the summer through the Summer Institute of Linguistics. A maximum of 10 credits of these courses may be applied to the English major. Students considering graduate work in language and linguistics are urged to study more than one foreign language.

Scenario Three: You are considering attending graduate school in English, in another discipline, or law school. Include courses from this list:

ENGL 372 Literary Theory (topics rotate and may be repeated with different topics) 3
ENGL 401 Studies in Medieval Literature 3
ENGL 403 Studies in Colonial American Literature 3
ENGL 404 Studies in Renaissance Literature 3
ENGL 405 Studies in Restoration and Eighteenth Century Literature 3
ENGL 406 Studies in Nineteenth Century Literature 3
ENGL 407 Studies in Twentieth Century Literature 3
ENGL 408 Writing for Digital Environments 3
ENGL 415 Seminar in Literature (topics rotate and may be repeated with different topics) 1-4

B.A. with Major in English

Teacher Licensure

Through a partnership with the College of Education and Human Development, and the Department of Teaching and Learning, students may seek secondary licensure in English. The following program of study must be completed:

I. The English major (described above), including level-II proficiency (two semesters) in a foreign language, 3 hours of speech, and 3 hours of developmental reading (T&L 416 Adolescent Literacy Development). (For Middle School licensure, 6 hours of developmental reading are required, including T&L 409 Reading in the Content Areas.) ENGL 423 Methods/Materials for Teaching Middle/Secondary English does not count toward the 36-hour English major.

Students are advised to create a major in which courses that satisfy the demands of a career in secondary teaching are balanced against the broader range of courses offered by the Department.

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 309 Modern Grammar</td>
</tr>
<tr>
<td>ENGL 359 Young Adult Literature</td>
</tr>
<tr>
<td>ENGL 308 The Art of Writing Nonfiction or ENGL 408 Writing for Digital Environments</td>
</tr>
</tbody>
</table>

Total Credits 9

Recommended in the major:

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 209 Introduction to Linguistics</td>
</tr>
<tr>
<td>ENGL 301 Survey of English Literature I</td>
</tr>
<tr>
<td>ENGL 302 Survey of English Literature II</td>
</tr>
<tr>
<td>ENGL 303 Survey of American Literature</td>
</tr>
<tr>
<td>ENGL 304 Survey of American Literature</td>
</tr>
<tr>
<td>ENGL 315 Shakespeare</td>
</tr>
<tr>
<td>ENGL 316 Shakespeare</td>
</tr>
<tr>
<td>ENGL 357 Women Writers and Readers</td>
</tr>
<tr>
<td>ENGL 359 Young Adult Literature</td>
</tr>
<tr>
<td>ENGL 365 Black American Writers</td>
</tr>
</tbody>
</table>

Total Credits 30

II. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 615) for admission and licensing requirements).

III. The Program in Secondary Education, to include:

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 319 Inclusive Strategies</td>
</tr>
<tr>
<td>T&amp;L 339 Technology for Teachers</td>
</tr>
<tr>
<td>T&amp;L 345 Curriculum Development and Instruction</td>
</tr>
<tr>
<td>T&amp;L 350 Development and Education of the Adolescent</td>
</tr>
<tr>
<td>T&amp;L 416 Adolescent Literacy Development</td>
</tr>
<tr>
<td>ENGL 423 Methods/Materials for Teaching Middle/Secondary English (spring only)</td>
</tr>
<tr>
<td>T&amp;L 432 Learning Environments</td>
</tr>
<tr>
<td>T&amp;L 433 Multicultural Education</td>
</tr>
<tr>
<td>T&amp;L 486 Field Experience *</td>
</tr>
<tr>
<td>T&amp;L 487 Student Teaching</td>
</tr>
<tr>
<td>T&amp;L 488 Senior Seminar</td>
</tr>
</tbody>
</table>

Total Credits 29-44

* taken concurrently with ENGL 423 Methods/Materials for Teaching Middle/Secondary English; 60 hours per semester

English majors seeking secondary licensure must have an adviser in both the English Department and the Department of Teaching and Learning.

Students planning to teach in Minnesota are required to take coursework in Middle Level Education; consult Teaching & Learning advisers for more information.

IV. Optional

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 386 Field Experience</td>
</tr>
<tr>
<td>T&amp;L 390 Special Topics</td>
</tr>
</tbody>
</table>

Total Credits 2-4

Minor in English

Required: 20 hours, including:

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 271 Reading and Writing about Texts</td>
</tr>
<tr>
<td>ENGL 272 Introduction to Literary Criticism</td>
</tr>
</tbody>
</table>

English electives, nine credits of which must be numbered 300 or above

Total Credits 15
Students seeking secondary certification in another discipline who wish to achieve a minor in English should take the following courses as part of the minor:

- ENGL 309 Modern Grammar 3
- ENGL 359 Young Adult Literature 3
- ENGL 308 The Art of Writing Nonfiction 3
- or ENGL 408 Writing for Digital Environments 3

Total Credits 9

Certificate in Writing and Editing

The ability to present ideas and concepts artfully and in a professional style is highly valued by employers, no matter what the medium or context - print or digital; business or the academy. Courses are designed with three goals for student learning:

- to introduce the role of information processing in our culture, both in print and electronic media;
- to offer hands-on experience in the production of texts in academic and commercial contexts;
- to promote the clear and concise dissemination of ideas and information.

The certificate is comprised of 18 credit hours. English courses taken for the certificate, with the exception of the required writing course, do not count towards the English major or minor. The following courses are required for the certificate:

**Required courses:**
- ENGL 234 Introduction to Writing, Editing, and Publishing 3
- ENGL 334 Practicum in Writing, Editing, and Publishing 3
- ENGL 428 Digital Humanities 3

**One of the following courses:**
- ENGL 226 Introduction to Creative Writing 3
- ENGL 308 The Art of Writing Nonfiction 3
- ENGL 408 Writing for Digital Environments 3

**Six credits from the following courses:**
- ART 273 Graphic Design Foundations 3
- COMM 206 Digital Communication: Fundamentals 3
- COMM 305 Web and Mobile Publishing 3
- COMM 319 Digital Communication: Imaging 3
- COMM 345 Social Media Strategy 3
- TECH 102 Digital Design Software 3
- TECH 212 Visual Literacy 3
- TECH 232 Web Design 3

Courses

**ENGL 95. Introduction to Academic Writing. 3 Credits.**

(Not Degree Countable). A course which helps students practice the academic writing skills that they will continue to develop in English 110. Course includes instruction in the reading of academic arguments, the process of revision, and the conventions associated with integrating sources into written work. Prerequisite: An ACT English score of 13 or below or an SAT writing score of 350 or below or department approval. F.

**ENGL 100. Individualized Instruction in College Composition. 1 Credit.**

(Not Degree Countable). Supplemental, individualized writing support for students enrolled in English 110. Prerequisite: An ACT English score of 14-17 or an SAT Writing score of 360-420 or a COMPASS Writing Skills score of 76 or below or a ACCUPLACER WritePlacer score of 4 or below; ENGL 110 is the corequisite. F.S.

**ENGL 110. College Composition I. 3 Credits.**

Immersion in college-level critical reading and expository writing, emphasizing revision and careful preparation of manuscripts. The credit from this course will not count toward an English major or minor. F.S.

**ENGL 130. Composition II: Writing for Public Audiences. 3 Credits.**

Continues the work of College Composition I with an emphasis on rhetoric and critical thinking. Requires the writing and production of both primary and secondary research, while asking students to apply that research to larger community issues. Students will practice writing with an immediate and explicit public purpose. Prerequisite: ENGL 110. F.S.

**ENGL 209. Introduction to Linguistics. 3 Credits.**

An introduction to the nature of language, phonology, grammar, semantics, and historical, geographical, social, and developmental aspects of language. F.S.

**ENGL 255. Introduction to Film. 3 Credits.**

The study of film drama, concentrating on appreciation and evaluation of motion pictures. F.S.

**ENGL 226. Introduction to Creative Writing. 3 Credits.**

An introduction to the types and basic principles of creative writing, taught through a combination of class discussion and practice-writing. F.S.

**ENGL 227. Introduction to Literature and Culture. 3 Credits.**

A course with alternating topics that asks students to read literary texts of a variety of genres. The course may emphasize form and texts from various historical periods as it introduces students to the pleasures of analyzing text and culture. Repeatable when topics vary. Repeatable. F.S.

**ENGL 228. Diversity in Global Literatures. 3 Credits.**

This course will explore global literatures with a special emphasis on concepts like culture, difference, and diversity. The course will analyze literature in cultural and historical contexts, and will emphasize the complex ways that literature is influenced by issues of social power (especially those that affect significant categories through which social inequalities are negotiated--such as gender, race, class, and sexual orientation). F.

**ENGL 229. Diversity in U.S. Literatures. 3 Credits.**

This course will explore U.S. literatures with a special emphasis on concepts like culture, difference, and diversity. The course will analyze literature in cultural and historical contexts, and will emphasize the complex ways that literature is influenced by issues of social power (especially those that affect significant categories through which social inequalities are negotiated--such as gender, race, class, and sexual orientation). F.

**ENGL 234. Introduction to Writing, Editing, and Publishing. 3 Credits.**

An overview of editing as a career and of publishing as a process from the perspective of both the editor and the writer. Explores job opportunities in the field, and helps students develop an introductory skills set for gaining those jobs. F.S.

**ENGL 235. The Art of Filmmaking. 3 Credits.**

This is a hands-on workshop-oriented course where students practice the art of filmmaking. The course may include screenwriting and/or film production. Repeatable. F.S.

**ENGL 241. World Literature I. 3 Credits.**

Great literature of western Europe, or in the European tradition, studied with emphasis upon intellectual and cultural values. F.

**ENGL 242. World Literature II. 3 Credits.**

Great literature of western Europe, or in the European tradition, studied with emphasis upon intellectual and cultural values. S.

**ENGL 271. Reading and Writing about Texts. 3 Credits.**

A writing-intensive course that introduces students to various schools of literary criticism. Required of English majors. F.S.

**ENGL 272. Introduction to Literary Criticism. 3 Credits.**

A writing-intensive introduction to English Studies offering practice in the conventions of analyzing texts and of writing literary analysis. Required of English majors. F.S.

**ENGL 299. Special Topics. 1-4 Credits.**

A course for undergraduate students, on topics varying from term to term. Repeatable when topics vary. Repeatable to 40 credits. F.S.

**ENGL 301. Survey of English Literature I. 3 Credits.**

English literature from its beginnings to the twenty-first century. F.

**ENGL 302. Survey of English Literature II. 3 Credits.**

English literature from its beginnings to the twenty-first century. S.

**ENGL 303. Survey of American Literature. 3 Credits.**

The literature of the United States from its beginnings to the twenty-first century. F.
ENGL 304. Survey of American Literature. 3 Credits.
The literature of the United States from its beginnings to the twenty-first century. S.

ENGL 306. Creative Writing: Fiction. 3 Credits.
Intermediate-level study and practice of fiction-writing. Prerequisite: ENGL 226 or instructor's permission. F.S.

ENGL 308. The Art of Writing Nonfiction. 3 Credits.
Advanced writing. Emphasis on rhetorical effectiveness and style. Prerequisite: ENGL 120 or ENGL 125 or ENGL 130. F.S.

ENGL 309. Modern Grammar. 3 Credits.
Various approaches to the structure of modern English, with emphasis on dialect variation and applications to the problems of teaching. F.

ENGL 315. Shakespeare. 3 Credits.
The study of Shakespeare's works. F.

ENGL 323. Studies in Literary Genre. 3 Credits.
Genre-specific study of literature. Repeatable if topics vary. Repeatable to 12 credits. On demand.

ENGL 334. Practicum in Writing, Editing, and Publishing. 3 Credits.
Intensive practice in preparing materials for publication in a variety of media. Prerequisite: ENGL 234 or permission of instructor. Repeatable to 6 credits. F.S.

ENGL 357. Women Writers and Readers. 3 Credits.
Literature by and about women, examining the social, historical, and aesthetic significance of the works. Repeatable when topics vary. Repeatable to 21 credits. F.S.

ENGL 359. Young Adult Literature. 3 Credits.
The study of literature for and about young adults (from the middle school through the high school years), examining the social, historical, and aesthetic significance of the works. S.

ENGL 365. Black American Writers. 3 Credits.
Writing by Black Americans studied for understanding and critical appreciation. S.

ENGL 367. American Indian Literatures. 3 Credits.
A study of historical and contemporary literature by American Indians. S.

ENGL 369. Literature and Culture. 3 Credits.
The study of literature in its cultural context. Repeatable when topics vary. Repeatable. F.S.

ENGL 370. Language and Culture. 3 Credits.
Interaction of language with other cultural subsystems. (Same course as Anthropology 370.). Prerequisite: ENGL 209. S.

ENGL 372. Literary Theory. 3 Credits.
An exploration of particular writers of, approaches to, or debates within literary theory and criticism. Topic varies by semester. Repeatable. Repeatable. F.S.

ENGL 397. Cooperative Education. 1-8 Credits.
A course designed to offer English majors work experience related to their discipline. This program will provide opportunities for non-business majors. This program will appear on student transcripts to provide official recognition for completion of this entrepreneurship educational experience. Repeatable to 9 credits. F,S.

ENGL 398. Independent Study. 1-4 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Prerequisites: Consent of the Department and approval of the Honors Committee. Repeatable to 9 credits. F.S.

Entrepreneurship (ENTR), School of

http://business.und.edu/undergraduate/school-of-entrepreneurship/index.cfm

Silvernagel (Chair), Batchelor and Clement

Entrepreneurship is a multidisciplinary program within the College of Business and Public Administration. This program will prepare students to design and launch their own ventures, regardless of mission (for profit, not-for-profit or social), or effectively serve existing organizations. Entrepreneurship courses and programs are offered to both business and non-business majors.

The Entrepreneurship Major is designed to help prepare students for effective new venture creation and management. Students majoring in Entrepreneurship will pursue in-depth study of the needs of new and emerging ventures and existing businesses, using an entrepreneurial focus. Additionally, Entrepreneurship majors are challenged to pursue development of their own business ideas. While it is not expected that all students in the Entrepreneurship major will establish new ventures immediately upon graduation, there is reason to believe that eventually, many Entrepreneurship graduates will start their own businesses. There is also a three-course Entrepreneurship Track available to business students majoring in one of the other disciplines who would like to add an entrepreneurship emphasis to their educational experience.

The College also offers a sixteen-credit Entrepreneurship Certificate program for non-majors. This program will appear on student transcripts to provide official recognition for completion of this entrepreneurship educational experience. This course sequence will provide opportunities for non-business majors to learn about business and administrative functions and to provide...
career enhancement. Students will better understand how the business functions will play a role in their future endeavors and how they can succeed in these efforts.

Entrepreneurship students are encouraged to immerse themselves in the practice of entrepreneurship and build a large portfolio of entrepreneur experiences while enrolled in the program. The more engaged the student becomes with the program, the more success and growth is experienced. This experiential learning includes such activities as doing class projects involving innovation and venturing, networking with successful entrepreneurs, getting involved in student groups, or participating in special events like the Department's own Entrepreneurship Challenge Business Plan Competition.

**College of Business and Public Administration**

### B.B.A. with Major in Entrepreneurship

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Business and Public Administration Requirements (see BPA listing) and including:

#### Pre-Business Core (Required 31 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ACCT 201</td>
<td>Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
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<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<tr>
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<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
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<td>Fundamentals of Public Speaking</td>
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</tr>
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</table>

#### Business Core (Required 24 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
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<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
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<td>MGMT 301</td>
<td>Operations Management</td>
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<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
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#### Courses required for Entrepreneurship Major (Required 29 credit hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENTR 250</td>
<td>Imagination, Creativity and Entrepreneurial Thinking</td>
<td>3</td>
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<tr>
<td>TECH 270</td>
<td>Design Thinking</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 290</td>
<td>Venture Initiation</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 311</td>
<td>Professional Selling</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 316</td>
<td>Entrepreneur Law &amp; Operations</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 386</td>
<td>Entrepreneurship: The Numbers</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 388</td>
<td>Entrepreneurship: The Money</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 390</td>
<td>Venture Implementation</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 490</td>
<td>Entrepreneurship Senior Seminar</td>
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</tr>
<tr>
<td>ENTR 497</td>
<td>Entrepreneurship Practice</td>
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</table>

#### Total Credits

| Total Credits | 84 |

### Certificate for Non-Business Majors

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>ENTR 101</td>
<td>Introduction to Entrepreneurship</td>
<td>3</td>
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</tbody>
</table>

| Total Credits | 3 |

### Entrepreneurship Track for Business Majors

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>ENTR 386</td>
<td>Entrepreneurship: The Numbers</td>
<td>3</td>
</tr>
</tbody>
</table>

| Total Credits | 18 |

### B.B.A. with a Major in Information Systems

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. College of Business and Public Administration requirements (see BPA listing) and including:

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#### Pre-Business Core (Required 31 hours)

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</tbody>
</table>

#### Total Credits

| Total Credits | 55 |

### Information Systems Major Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>TECH 230</td>
<td>User Experience and Interface Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 300</td>
<td>Application Development</td>
<td>3</td>
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<tr>
<td>ISBC 330</td>
<td>Database Design</td>
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<tr>
<td>ISBC 340</td>
<td>Fundamentals of Networking</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 370</td>
<td>Web Development</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 410</td>
<td>Information Security</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 490</td>
<td>Information Systems Analysis and Design Seminar</td>
<td>3</td>
</tr>
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</table>

Electives at the 300+ level

<table>
<thead>
<tr>
<th>Electives</th>
<th>Approved by the Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Total Credits</td>
</tr>
</tbody>
</table>

### Total Credits

| Total Credits | 84 |

### B.S. in Graphic Design Technology

The B.S. in Graphic Design Technology (GDT) is an innovative, multidisciplinary degree that prepares you for an exciting array of careers in the private and public sectors. We teach you to plan, analyze, and create solutions to visual communication problems. You learn to consider cognitive, cultural, physical, economic, psychological, and social factors in planning and executing...
design solutions using a variety of media and technologies. We provide you with a diverse range of experiences and opportunities in a flexible learning environment. You attain a solid education that combines theory, practice, and application.

Graphic design is applicable to virtually any discipline so the B.S. in Graphic Design Technology is designed to give you the flexibility to seek education in other disciplines as well. Before completion of 9 hours of the GDT required courses, you are required to submit a Statement of Educational and Life Objectives (SELO) and a related Program of Study. The Program of Study must consist of a minimum of 32 additional semester hours and must be designed to help you achieve the objectives identified in your SELO. Your Program of Study cannot include any of the GDT required courses. The Program of Study must be approved by the School of Entrepreneurship before the student can be admitted to the B.S. GDT degree program.

The remaining hours are available for you to complete Essential Studies requirements and to seek other knowledge, credentials (degrees, majors, minors, etc.).

Required 125 credit hours including:

I. Essential Studies Requirements, see University ES Listing.

II. The College of Business and Public Administration GPA Graduation Requirement (2.50), see College section.

III. Graphic Design Technology Major Program Requirement, at least a 2.50 GPA in courses that apply toward the degree and major.

### Technology Requirements (40 Credit Hours Required)

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>TECH 102</td>
<td>Digital Design Software</td>
<td>3</td>
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<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<td>TECH 122</td>
<td>Computer-Aided Design</td>
<td>3</td>
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<tr>
<td>TECH 212</td>
<td>Visual Literacy</td>
<td>3</td>
</tr>
<tr>
<td>TECH 230</td>
<td>User Experience and Interface Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 330</td>
<td>Database Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 322</td>
<td>Digital Photography Fundamentals</td>
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<tr>
<td>TECH 332</td>
<td>Industrial Design</td>
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<tr>
<td>ISBC 370</td>
<td>Web Development</td>
<td>3</td>
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<tr>
<td>TECH 422</td>
<td>Advanced Digital Photography and Imaging</td>
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</tr>
<tr>
<td>TECH 442</td>
<td>Industrial/Applied Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 450</td>
<td>Packaging Design</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 490</td>
<td>Information Systems Analysis and Design Seminar</td>
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### B.S. Industrial Technology (IT) Degree Program

Industrial Technology is a field of study designed to prepare technical/management-oriented professionals for employment in business, industry, and government. The curriculum is organized to equip students with critical knowledge and skills for product innovation and process improvement.

Required 125 credit hours, and including:

I. Essential Studies Requirements, see University ES listing.

II. The College of Business and Public Administration GPA Graduation Requirement (2.50), see College section.

III. Industrial Technology Major Program Requirements: At least a 2.50 GPA in courses that apply toward the degree and major, and the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>TECH 110</td>
<td>Fundamentals of Technology</td>
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<td>TECH 122</td>
<td>Computer-Aided Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 201</td>
<td>Electromechanical Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>TECH 203</td>
<td>Production Processes &amp; Material Testing</td>
<td>4</td>
</tr>
<tr>
<td>TECH 211</td>
<td>Electric Circuits and Devices</td>
<td>4</td>
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<tr>
<td>TECH 223</td>
<td>Applied Synthetics</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 300</td>
<td>Application Development</td>
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### Minor in Information Systems

22 semester hours, including:

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<tbody>
<tr>
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</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
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<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
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</tr>
<tr>
<td>ISBC 330</td>
<td>Database Design</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 340</td>
<td>Fundamentals of Networking</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 370</td>
<td>Web Development</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 410</td>
<td>Information Security</td>
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</tbody>
</table>

Total Credits 22

### Electronic Technologies, Manufacturing Technologies, and Technical Design

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>TECH 110</td>
<td>Fundamentals of Technology</td>
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<tr>
<td>TECH 122</td>
<td>Computer-Aided Design</td>
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<tr>
<td>TECH 201</td>
<td>Electromechanical Fundamentals</td>
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<tr>
<td>TECH 203</td>
<td>Production Processes &amp; Material Testing</td>
<td>4</td>
</tr>
<tr>
<td>TECH 300</td>
<td>Technology and Society</td>
<td>3</td>
</tr>
<tr>
<td>TECH 332</td>
<td>Industrial Design</td>
<td>3</td>
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<tr>
<td>TECH 440</td>
<td>Occupational Safety</td>
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Total Credits 21

### Graphic Design Technology

21 credits including the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
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<tbody>
<tr>
<td>TECH 102</td>
<td>Digital Design Software</td>
<td>3</td>
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<tr>
<td>TECH 212</td>
<td>Visual Literacy</td>
<td>3</td>
</tr>
<tr>
<td>TECH 230</td>
<td>User Experience and Interface Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
</tr>
<tr>
<td>TECH 322</td>
<td>Digital Photography Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TECH 422</td>
<td>Advanced Digital Photography and Imaging</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 21
ENTR 101. Introduction to Entrepreneurship. 3 Credits.
ENTR 101 is an introductory course structured to provide a firm basis as to the critical role entrepreneurs and entrepreneurship plays in the global economy. Entrepreneurship will be analyzed, debated, assessed, and explored experientially throughout the semester from an interdisciplinary perspective. Entrepreneurship will be viewed as a manageable process and way of thinking, acting, and behaving applicable not only to business endeavors, but to everyday problems existing in the workplace and society. F.S.

ENTR 250. Imagination, Creativity and Entrepreneurial Thinking. 3 Credits.
Do you know that creativity can be learned? It is a process. You can become more creative! Together we explore creative processes, dispel creativity myths, and help you cultivate opportunity recognition and creative problem solving. You will work individually, and we will work in teams, to expand your creativity and entrepreneurial mindset. This is an intensely experimental course, come experience it with us. F.S.

ENTR 290. Venture Initiation. 3 Credits.
Have you ever seen a product and thought to yourself, "I thought of that first!" Although ideas are important, ideas don’t affect your life, others’ life, unless they are brought to fruition. In this course, you will learn to determine whether or not your idea “will sell”. You will learn how to refine your idea so that it “will sell”, or when to “pivot” and go in a different direction. Fair warning to introverts, you will need to spend a lot of time outside the classroom interacting with people. It’s fun...really! F.S.

ENTR 316. Entrepreneur Law & Operations. 3 Credits.
Starting your own venture? Do you know the legal hurdles you must leap? This is not a dry, legal lecture series. Learn entrepreneurship law hands-on! Experience relevant legal requirements as you form a real or simulated corporation/LLC, participate in mock owner disputes, draft contracts, hire employees, assume debt, sell equity, file for bankruptcy, franchise, and a host of other exciting activities! Who knew? Law doesn’t have to be boring! F.S.

ENTR 385. Venture Initiation. 3 Credits.
Have you ever seen a product and thought to yourself, "I thought of that first!" Although ideas are important, ideas don’t affect your life, others’ life, unless they are brought to fruition. In this course, you will learn to determine whether or not your idea "will sell”. You will learn how to refine your idea so that it "will sell", or when to "pivot" and go in a different direction. Fair warning to introverts, you will need to spend a lot of time outside the classroom interacting with people. It’s fun...really! F.S.

ENTR 386. Entrepreneurship: The Numbers. 3 Credits.
You’ve got a great idea. That’s fantastic! But will it make money? You need to crunch the numbers, to read and analyze financial data, and to write financial reports that clearly convey the value of your idea to potential buyers and investors. Numbers matter. Understanding and communicating numbers matter more! F.S

ENTR 388. Entrepreneurship: The Money. 3 Credits.
You’ve figured out what you want to bring to the market, done all the analysis, written a bang-up proposal--now all you need is some funding. This is where you learn how to raise money for your venture. We explore internal/external capital generation (debt, equity, bootstrapping), the time value of money, cash flow management, venture valuation, and exit strategies. In a nutshell, you learn how to raise money for your venture. We explore internal/external capital generation (debt, equity, bootstrapping), the time value of money, cash flow management, venture valuation, and exit strategies. In a nutshell, “money matters”--because money matters. Prerequisite: ENTR 386. F.S.

ENTR 390. Venture Implementation. 3 Credits.
You’ve applied the knowledge you learned in ENTR 290 and believe you have a product or service that will sell in the market--now what? Now you need to get the right people and systems in place, manage limited resources, bootstrap or obtain outside financing (or both), lead and delegate, establish and live a sustainable organizational culture that is innovative, responsive and resilient. Let’s build your venture together. Prerequisites: ENTR 290 and ENTR 386. S.

ENTR 395. Special Topics. 1-4 Credits.
Specially arranged seminars, courses, or independent study on a variety of topics not covered by regular program offerings. May be initiated by students with approval of the dean and department(s) involved. Prerequisite: Instructor consent. Repeatable to 9 credits. On demand.

ENTR 410. Marketing and Management Concepts for Entrepreneurship. 3 Credits.
Marketing and managing your startup--it’s different from corporate management and marketing. This course is an introduction to the nature, significance and role of marketing and management in startup organizations. The primary objective is to explore the management and marketing functions from product/service conceptualization through the initial stages of startup growth sustainability. F.

ENTR 490. Entrepreneurship Senior Seminar. 2 Credits.
Entrepreneurship is a dynamic and exciting adventure! In order to be successful you need to stay abreast of current trends in society, industry, finance, sales, marketing, technology and beyond. We spend a lot of time with guest entrepreneurs, mentors and Professors of Practice to examine current topics through a lens focused by what you’ve learned, lean into the winds of change and try to focus our watery eyes on your future. Prerequisite: ENTR 390. S.

ENTR 497. Entrepreneurship Practice. 3 Credits.
Practical experience with an entrepreneurial firm or comparable experiential learning. All ENTR 497 experiences must be pre-approved by the Entrepreneurship Practice Director prior to beginning the experience. Prerequisites: ENTR 290 and Department consent. Repeatable to 3 credits. S/U grading. F.S.SS.

ISBC 117. Personal Productivity with Information Technology. 1 Credit.
Introductory lab-based course covering basic computer hardware, operating systems, software, and Microsoft Office tools. F,S.SS.

ISBC 217. Fundamentals of Computer Information Systems. 3 Credits.
Major emphasis on information technology, enterprise systems and business processes, database management, decision support systems, strategic information systems, and the utilization of these technologies as productive business professionals. Prerequisite or Corequisite: ISBC 117. F.S.SS.

ISBC 220. Business Research Writing. 3 Credits.
An exposure to research writing, including what research is and its importance in the business world. Students will be shown how to gather data, analyze data, and manage the writing process. Students will learn how to develop and structure an academic research paper. Prerequisites: ENGL 120 or ENGL125 or ENGL 130, and ISBC 117. Prerequisite or Corequisite: ECON 210. On demand.

ISBC 240. Operating Systems Principles. 3 Credits.
An introduction to a variety of computer operating systems. Emphasis placed on terminology, concepts, system commands, architecture, maintenance, and troubleshooting. Hands-on experience with operating systems and operating environments such as Windows and UNIX at the workstation and server level. Prerequisite: ISBC 117. On demand.

ISBC 260. Digital Technology for Entrepreneurs. 3 Credits.
All new ventures utilize digital technology. Even the most basic enterprise is dependent upon digital technology to function efficiently and effectively. You will explore and learn some of the common digital technologies that assist with entrepreneurial thinking. We will also play with technologies that form the basis of new digital ideas, products and services. F.S.

ISBC 300. Application Development. 3 Credits.
An introduction to mobile computing with an emphasis on application development for a mobile operating system, e.g., Android. Topics include mobile computing basics, development environments, user interfaces, audio, location, databases, and graphics. Course contents will be adjusted based on the backgrounds and interests of enrolled students. At the end of this class, you will have a firm understanding of mobile computing, be able to develop applications in a mobile platform, and be aware of the technologies that address mobile computing. F.

ISBC 305. End-User Applications. 3 Credits.
Development of proficiency in the use of end-user software applications with emphasis on spreadsheet and database. Spreadsheet applications include solutions for typical business situations using functions, macros and linking. Database applications include development of and querying of databases, linking, generating forms and reports, and developing menus. Prerequisite: ISBC 117. F.S.
ISBC 330. Professional Communication for Business. 3 Credits.
An overview of the communication process, including composition of business letters and reports, use of computer technologies, strategies for oral communication and listening, as well as a brief review of writing mechanics. Clear, concise, effective presentation and logical organization of business messages are emphasized. F.S.

ISBC 330. Database Design. 3 Credits.
Database design techniques to include, but not limited to, database models, terminology, database normalization, entity-relationship diagramming and an introduction to SQL. Prerequisite: ISBC 117. F.

ISBC 340. Fundamentals of Networking. 3 Credits.
Explores principles of networking computer systems; telecommunications hardware, software, and media components; and approaches to efficient business data communications. The student will be exposed to telecommunications terminology, concepts, protocols, and logical and physical design of local area networks. S.

ISBC 350. Networking II. 3 Credits.
An in-depth study of networking protocols, planning, design, security, VLANS, switch and router configuration, workstation and server management, troubleshooting, and when possible, enterprise level network topics. Prerequisite: ISBC 340. On demand.

ISBC 370. Web Development. 3 Credits.
An introduction to web application development in a business environment. Students learn programming theory, fundamentals and practices in writing programs to meet business requirements, solve business problems, and address business opportunities in the desktop, mobile and/or Internet/intranet environments. Prerequisite: TECH 232. S.

ISBC 410. Information Security. 3 Credits.
An introduction to information security and information assurance. The students will achieve a firm intuition about what information security means; be able to recognize potential threats to information confidentiality, integrity and availability; be aware of some of the underlying technologies that address these challenges; and be conversant with current security-related issues in the field. This course addresses both the technical and behavioral aspects of information security. Prerequisites: ISBC 330, ISBC 340, and ISBC 370. F.

ISBC 430. Database Programming. 3 Credits.
Information system programming using embedded database queries and calls to stored procedures. The development of stored procedures and triggers in databases. Topics will include accessing data via ODBC native drivers, dynamic SQL generation, T-SQL and intermediate programming skills. Prerequisites: ISBC 330 and ISBC 370. On demand.

ISBC 431. Database Administration and Optimization. 3 Credits.
Focuses on the administration of business databases and the optimization of database performance at the server level. Topics may include but are not limited to user and security administration, physical organization and optimization, performance maintenance and monitoring, fault tolerance, database distribution and replication. Prerequisite: ISBC 430. On demand.

ISBC 444. Philosophy of Vocational Education. 3 Credits.

ISBC 451. Networking III. 3 Credits.
Focuses on exploring a variety of advanced networking topics. Students will develop knowledge and practical skills including, but not limited to, advanced configuration, implementation, security, and troubleshooting of network servers, services, devices, resources, and infrastructure. Prerequisite: ISBC 350. On demand.

ISBC 471. Advanced Information Systems Programming. 3 Credits.
Advanced-level programming in a business environment. Students apply programming and database theory, fundamentals and practices learned in ISBC 370 and ISBC 430 to address complex business problems and opportunities in the desktop, mobile and/or Internet/intranet environments. Prerequisite: ISBC 430. On demand.

ISBC 490. Information Systems Analysis and Design Seminar. 3 Credits.
The capstone course for the Information Systems major. System analysis and design is taught and applied through team development of an information system. Prerequisites: ISBC 320, ISBC 340, ISBC 370, and ISBC 410. S.

ISBC 497. Practical Experience. 1-3 Credits.
Application of your ISBC education in a work setting. All ISBC 497 experiences must be pre-approved by the ISBC Internship Coordinator prior to beginning the experience. May be taken for up to 3 credits a semester as follows: 10-20 hours / week = 1 credit; 20-30 hours / week = 2 credits; over 30 hours / week = 3 credits. Prerequisites: ISBC 330 and ISBC 340 or instructor consent. Repeatable to 3 credits. S/U grading. F,S,SS.

ISBC 499. Special Topics. 1-3 Credits.
Topics will be selected on the basis of currency and relevancy to student needs. Repeatable to 12 credits. Repeatable to 12 credits. On demand.

TECH Courses

TECH 102. Digital Design Software. 3 Credits.
Learn to use industry-standard software to explore the principles of graphic design. You learn the principles of design production and develop the ability to communicate effectively in a visual format. F.

TECH 110. Fundamentals of Technology. 2 Credits.
The study of the philosophy and objectives of technology with emphasis on the theories, principles, and concepts of manufacturing, design, and electronics. F.

TECH 122. Computer-Aided Design. 3 Credits.
You are introduced to computer-aided design/drafting using AutoCAD software and technical drawing techniques to include blueprint interpretation, various projections, pictorials, dimensioning, developments and tolerancing. Hands-on exercises and drawing problems are reflective of industry and business. S.

TECH 200. Energy Fundamentals. 3 Credits.
The objective of the Energy Fundamentals course is to provide students with the fundamental knowledge to understand, and qualitatively and quantitatively calculate how energy is converted from basic energy sources such as fossil fuels, biomass, solar energy and wind to electrical energy. F.

TECH 201. Electromechanical Fundamentals. 4 Credits.
The study of the fundamental properties of mechanical, hydraulic, and electronic/electrical systems (primarily those that revolve around Direct Current (DC) including an introduction to Programmable Logic Controllers (PLCs). Experiential learning is facilitated through the use of project design and development. Prerequisite: MATH 103. Corequisite: PHYS 161 or equivalent. F.

TECH 202. Advanced Application of CADD Techniques. 3 Credits.
The advanced study of computer aided design/drafting to include 3D coordinates and layout, subsurface meshes, regions, solid modeling, and connection to computer numerical control (CNC). The creation of presentation graphics using bitmap files, shading, and rendering is also presented. Prerequisite: TECH 122 or consent of instructor. S.

TECH 203. Production Processes & Material Testing. 4 Credits.
This course provides students with an understanding of manufacturing processes and the strong interrelationships between manufacturing processes, product design, and material properties. Emphasis is placed on standard manufacturing processes such as casting, heat treatment, forming, turning, and milling. Additional topics covered will include material testing and inspection, and the interpreting technical drawings. S.

TECH 204. Industrial Materials. 4 Credits.
The theoretical and laboratory study of the physical and chemical attributes of organic and inorganic materials for conversion into industrial materials are explored. Source, structure, characteristics, properties, and practical applications of metallic, polymer, wood, ceramic, and composite materials are introduced. Laboratory activities are designed to explore the attributes of these materials as well as to practice the material testing processes. F.

TECH 211. Electric Circuits and Devices. 4 Credits.
The subject matter covered in this course will include concepts, principles, and operational characteristics of electronic/electrical components with a focus on Alternating Current (AC), discrete and integrated devices including computer driven electronic control systems. Design and developmental activities are facilitated through the use of simulation-Multisim software-and Ultiboard, a Printed Circuit Board (PCB) design and development software. Prerequisite: TECH 201, MATH 103 and MATH 105. S.

TECH 212. Visual Literacy. 3 Credits.
This course introduces the basic concepts of graphic design and visual communication. You sharpen brainstorming and problem-solving skills via design principles, color theory, and typography as they sharpen brainstorming and problem-solving skills. Prerequisite: TECH 102. S.
TECH 213. Wood Products Manufacturing. 3 Credits.
An introductory study of wood manufacturing methods and techniques utilizing tools and machines leading to the production of constructed assemblies. Prerequisite: TECH 110 or TECH 204 or consent of instructor. F, even years.

TECH 223. Applied Synthetics. 3 Credits.
A study of synthetic/polymer materials emphasizing identification of characteristics and properties; and their application as related to industrial products. Prerequisites: CHEM 115/115L or 121/121L. F, odd years.

TECH 230. User Experience and Interface Design. 3 Credits.
Have you ever felt frustrated using a website or digital interface that didn't function properly? This course introduces you to the common ways in which humans interact with digital interfaces. Through study of user experience principles, you will design digital interfaces that are easy to use. F.

TECH 232. Web Design. 3 Credits.
Learn how to design for the web using HTML and CSS. This class provides you with the principles and tools to create modern, aesthetically pleasing websites that are easy to navigate. S.

TECH 270. Design Thinking. 3 Credits.
Ever had a problem you didn't have any idea how to solve? Design thinking is actually a problem solving process you can learn! You will learn to approach highly unstructured problems and to create opportunities of them. Design thinking is an important entrepreneurial skill, but it is an equally important life skill. Design thinking is empowering—and a lot of fun. F,S.

TECH 300. Technology and Society. 3 Credits.
A lecture-recitation course emphasizing the various impacts of technology on the individual, society, environment and basic institutions. Technological matrix of various cultures. F,S.

TECH 311. Computers and Emerging Technologies. 3 Credits.
An introductory course to the personal computer with an emphasis on system hardware, boot-up sequence, configuration and customization, operating systems, upgrading, and troubleshooting. The course will also examine emerging computer technologies, various peripheral devices and interfaces, including network and computer wireless communications systems. F.

TECH 322. Digital Photography Fundamentals. 3 Credits.
Taking good pictures is more than point and click! This course is introduces the basic aesthetic and technical theories and techniques of digital photography. A digital camera with aperture priority, shutter priority, manual, and exposure compensation is required. F.

TECH 330. Quality Assurance. 3 Credits.
The study of principles and techniques of quality assurance and quality management, with an emphasis on the fundamentals of quality assurance for products, process control, and process capability. Related topics include quality design review, fundamentals of statistics, sampling and control chart systems, quality reporting, process capability analysis, tool and gauge control, document control, and troubleshooting quality control. Prerequisite: ECON 210 or consent of instructor. S, odd years.

TECH 332. Industrial Design. 3 Credits.
In this industrial design course students will learn how to design products in support of human activities and interactions. Principles and techniques of needs assessment, patent research, concept realization, design alternatives, and prototype development will be introduced through a creative and inventive process to address various instrumental factors such as product aesthetics, functionality, materials, sustainability, and usability. Prerequisite: TECH 122 or consent of instructor. F.

TECH 340. Cost Estimating. 3 Credits.
Principles and techniques necessary for the economic analysis and evaluation of industrial design projects. Prerequisites: ECON 210, MATH 146, or equivalent, or consent of instructor. S, even years.

TECH 341. Digital Integrated Circuits. 3 Credits.
The study of basic concepts of digital circuits and devices; operational characteristics of digital integrated circuits. Prerequisite: TECH 211 or consent of instructor. S, odd years.

TECH 373. Advanced Manufacturing Processes. 3 Credits.
This advanced course in manufacturing covers both the theory and practice of advanced manufacturing. The course will focus on advanced machines and processes that are used to a significant degree in modern manufacturing facilities including conventional CNC machines and also non-traditional processes such as additive manufacturing. Students will demonstrate their knowledge of these processes through a series of lectures, discussions, and laboratory activities with the resultant knowledge necessary to apply these principles and processes to appropriate applications. Prerequisites: TECH 122 and TECH 203, or equivalent. S.

TECH 396. Field Experiences in Technology. 1-6 Credits.
Provides students with supervised opportunities to engage in various technical industrial or business experiences by working with and learning from practicing professionals. Repeatable to 6 credits. Prerequisite: Junior standing or consent of instructor. Repeatable to 6 credits. F,S,SS.

TECH 397. Cooperative Education. 1-6 Credits.
A practical work experience with an approved company in business or industry, arranged by the student, faculty and employer. Repeatable to 6 credits. Prerequisites: junior standing, GPA of 2.5 overall, and faculty approval. Repeatable to 6 credits. S/U grading. F,S,SS.

TECH 399. Honors Tutorial. 1-3 Credits.

TECH 400. Teaching Technology Education. 3 Credits.
An analysis of various methods employed in instructional techniques for industry and education. Development of methods and strategies of instruction use and ordering of instructional materials, based on behavioral objectives and classroom application of instructional techniques; lab activities. Prerequisites: Junior standing and consent of instructor. F, odd years.

TECH 403. Product Research and Development. 3 Credits.
The study of product development and production planning for manufacture through the application of research methodologies, design processes, and prototype development. Prerequisite: TECH 203 or consent of instructor. F.

TECH 420. Facilities Design. 3 Credits.
Principles and applications of designing industrial/business facilities with emphasis on site location, environmental consideration, qualitative and quantitative modeling. Computer application in facility planning and quantitative analysis; lab activities. Prerequisites: TECH 122. S.

TECH 422. Advanced Digital Photography and Imaging. 3 Credits.
Through specialized shooting techniques, this course builds upon the fundamentals learned in TECH 322 to expand your knowledge and abilities. You will explore several theme-based photographic topics that will challenge you visually and intellectually. Then you create a portfolio of unique photographs to tie these topics together into one theme. A digital camera with aperture priority, shutter priority, manual, and exposure compensation is required. Prerequisite: TECH 322 or consent of instructor. S.

TECH 433. Manufacturing Strategies. 3 Credits.
Theoretical and laboratory study of strategies utilized by business and industry to develop and maintain a competitive edge. Topics include lean manufacturing, Kanban, five S’s, Kaizen, push and pull modeling, fishbone-4Ms, line balancing, and Pokayoke. Prerequisites: TECH 122 and TECH 203. F.

TECH 440. Occupational Safety. 3 Credits.
The major safety concerns and problems commonly associated with the industrial and occupational environment are addressed. Emphasis is placed on the study of safety rules and regulations, implementation of management tools to benefit people for optimum safety conditions and productivity, and the documentation required for record keeping. Prerequisite: Upper division students only. S.

TECH 442. Industrial/Applied Graphic Design. 3 Credits.
We explore the concepts of branding, info-graphics and various avenues of processing and translating information in a visual format. Emphasis is placed on the relationship between text and image through a series of design-based problems. The visual and conceptual aspects of branding focuses on the development of practical, multi-component design solutions including logo design and other business communication applications. Understanding and ordering complex data into useful and persuasive informational tools takes form via info-graphics, visual processes and procedures. Emphasis is placed on the use of formal design principles, creative brainstorming, conceptualizing, critical thinking, collaboration, and presentation. Prerequisites: TECH 212. S.
**TECH 450. Packaging Design. 3 Credits.**
This course introduces you to the unique challenges of packaging design. Through prototypes and finished products, you develop solutions to 3D design problems that will delight the user. Special emphasis is placed on social, sustainable, and environmental issues in the packaging industry. Prerequisite: TECH 122. F.

**TECH 451. Computer Integrated Manufacturing. 3 Credits.**
A study of computer integrated systems and their designs to facilitate the manufacture and production processes. Topics covered the application and integration of Programmable Logic Controllers (PLCs), microcontrollers, touch-screen, TCP/IP, and voice control systems to facilitate manufacturing processes. Students will also utilize commercial computer-aided design tools, i.e., Multisim and Ulitboard to design, simulate, and test designed manufactured systems. Prerequisites: TECH 201 and TECH 211. F.

**TECH 452. Multimedia Production. 3 Credits.**
This advanced graphics course is designed to explore multimedia production technologies, concepts, processes, methods, and techniques. The course provides hands-on experience applying multimedia technology to integrate graphics, text, sound and video into meaningful productions. On demand.

**TECH 493. Workshop. 1-6 Credits.**
A workshop course on a specific topic, primarily for, but not confined to, Continuing Education. Repeatable to 24 credits. Repeatable to 24 credits. F,S,SS.

**TECH 497. Directed Studies in Technology. 1-8 Credits.**
Studies in topics relevant to the students' needs in selected topics including, but not limited to, Graphics, Electronics, Production, and Technology Education. Prerequisites: Junior Standing and instructor consent. Repeatable to 8 credits. F,S,SS.

**TECH 498. Senior Capstone I. 1 Credit.**
This course is designed for students to select the topic for their final Senior Capstone project, conduct the preliminary required research, and plan the final project. Prerequisites: Senior standing and consent of instructor. F.

**TECH 499. Senior Capstone II. 3 Credits.**
The capstone course is designed to integrate and reflect on coursework covered throughout the student's program in order to demonstrate knowledge, understanding and competency related to the program goals. The course also facilitates students’ transition from the academic to the professional world. Prerequisites: TECH 498, senior standing and consent of instructor. S.

**Finance (Fin)**
Beneda, Haskins, Lee, Nelson, Smith (Chair), and Zhang

The Department of Finance offers two programs of study:
1. Investments and
2. Managerial Finance.

The Investments major offers a focus on investing, professional asset management, and risk management. This major is designed to provide students with an appropriate balance between theoretical knowledge and specific decision-making skills. Foundation courses cover modern finance theory and modeling, including valuation of both financial and real assets. Utilizing the resources available in the Lanterman Investment Center, a state-of-the-art "trading room" environment, students expand their knowledge of investment-related topics, including equities, fixed income instruments, financial derivatives, foreign exchange transactions, and many more. Investments majors are required to participate in the Student Managed Investment Fund, which currently has approximately $1.2 million in assets under management.

*Any student pursuing an undergraduate degree, whether a major or a minor, offered by the Department of Finance must earn a passing grade in each of the required courses specified in the degree program. A student may not substitute a different course offered at the University of North Dakota to earn a passing grade.

Any course completed outside the Department of Finance of the University of North Dakota that is submitted for approval as a substitute for any course required for either the Investments major or Managerial Finance major must have been completed on site at another university as part of an AACSB-accredited degree program.

**B.B.A. with Major in Investments**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Business and Public Administration Requirements, see College listing and including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>6</td>
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<tr>
<td>&amp; ACCT 201</td>
<td>Elements of Accounting II</td>
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<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
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<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
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<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
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<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
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<td>ECON 303</td>
<td>Money and Banking</td>
<td>3</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<td>MATH 146</td>
<td>Applied Calculus I</td>
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<td>MGMT 300</td>
<td>Principles of Management</td>
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<td>MGMT 301</td>
<td>Operations Management</td>
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<td>FIN 310</td>
<td>Principles of Financial Management</td>
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<td>MGMT 475</td>
<td>Strategic Management</td>
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<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
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<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td>Select one of the following:</td>
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<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td></td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td></td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
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</table>

Total Credits 55

III. The Following Major Courses:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 218</td>
<td>Advanced Spreadsheet Applications</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 301</td>
<td>Intermediate Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>FIN 340</td>
<td>Intermediate Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 360</td>
<td>Capital Market Financing and Investment Strategies</td>
<td>3</td>
</tr>
<tr>
<td>FIN 370</td>
<td>Student Investment Fund I</td>
<td>1</td>
</tr>
<tr>
<td>FIN 415</td>
<td>Fixed Income Analysis and Portfolio Management</td>
<td>3</td>
</tr>
</tbody>
</table>
FIN 420 Investment Analysis and Portfolio Management 3
FIN 430 International Financial Management 3
FIN 450 Financial Derivatives 3
FIN 470 Student Investment Fund II 3
Select three of the following: 9
ACCT 302 Intermediate Accounting II
FIN 321 Real Estate Finance and Investment
FIN 324 Real Estate Appraisal
FIN 350 Financial Statement Analysis
FIN 375 Lending and Liquidity Management
FIN 475 Cases in Managerial Finance
FIN 497 Internship in Finance (no more than 3 credits)
SPRT 320 Sport Financial Management

Total Credits 37

B.B.A. with Major in Managerial Finance and Accounting

Required 127 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Business and Public Administration Requirements, see College listing and including:

ACCT 200 Elements of Accounting I 6
& ACCT 201 and Elements of Accounting II
ACCT 315 Business Law I 3
ISBC 117 Personal Productivity with Information Technology 1
ISBC 217 Fundamentals of Computer Information Systems 3
ECON 201 Principles of Microeconomics 3
ECON 202 Principles of Macroeconomics 3
ECON 210 Introduction to Business and Economic Statistics 3
ECON 303 Money and Banking 3
MATH 103 College Algebra 3
MATH 146 Applied Calculus I 3
MGMT 300 Principles of Management 3
MGMT 301 Operations Management 3
FIN 310 Principles of Financial Management 3
MGMT 475 Strategic Management 3
MRKT 305 Marketing Foundations 3
POLS 115 American Government I 3
COMM 110 Fundamentals of Public Speaking 3
Select one of the following: 3
ANTH 171 Introduction to Cultural Anthropology
PSYC 111 Introduction to Psychology
SOC 110 Introduction to Sociology

Total Credits 55

III. The Following Major Courses:

ACCT 218 Advanced Spreadsheet Applications 3
ACCT 301 Intermediate Accounting I 3
ACCT 302 Intermediate Accounting II 3
ACCT 309 Accounting Information Systems 3
ACCT 320 Cost Accounting 3
FIN 340 Intermediate Financial Management 3
FIN 350 Financial Statement Analysis 3
FIN 360 Capital Market Financing and Investment Strategies 3
FIN 475 Cases in Managerial Finance 3
Select three upper-division courses from Accountancy (Acct) or Finance (Fin) 9

Total Credits 36

Select three upper-division courses from Accountancy (Acct) or Finance (Fin) 9

Total Credits 36

Courses

FIN 220. Personal Investing. 3 Credits.
Investment concepts for individual investors who are, or will be, actively developing and monitoring their own investment portfolios. Covers basic analysis techniques, investment vehicles, strategies for implementing investment goals in a portfolio context, risk-return tradeoffs, and sources of investment information. Not available to students who have successfully completed FIN 420 or its equivalent. F.S.

FIN 251. Personal Finance. 3 Credits.
The personal financial planning and management process: goal identification and budgeting; minimizing tax liability; uses and costs of various forms of credit; buying, selling and/or leasing real estate, automobiles and other major items; life, health, property and income insurance; various investment options; the retirement planning process; and estate planning options. The role of financial planning professionals and financial planning as a career option are also discussed. F.S.

FIN 310. Principles of Financial Management. 3 Credits.
This course introduces students to asset management, cost of capital, dividend policy, valuation, capital structure planning, and working capital management. Forms of business organizations and tax environment are surveyed. Managerial implications of current developments in national and international capital markets are reviewed. Prerequisites: ACCT 201, ISBC 117, ECON 210; Sophomore, Junior or Senior Standing; minimum of 59 credit hours; declared and pre-CoBPA majors only. F,S,SS.

FIN 310L. Problems in Financial Management. 1 Credit.

FIN 321. Real Estate Finance and Investment. 3 Credits.
Nature of real estate finance, financial sources, role of government, real estate financial instruments, loan processing, defaults and foreclosures in real estate finance, fundamentals of real estate investment analysis. Prerequisites: FIN 310 and Sophomore, Junior or Senior standing. F.

FIN 324. Real Estate Appraisal. 3 Credits.
Nature of value; appraisal process; analysis of neighborhoods, land and improvements; cost, market data and income approach to value; appraisal report; code of ethics. Prerequisite: Sophomore standing or higher. S.

FIN 340. Intermediate Financial Management. 3 Credits.
Integrated coverage of topics in finance theory. This course continues to develop student understanding of corporate finance topics which were introduced in FIN 310. These topics include valuation, project analysis, capital structure planning, working capital management, and cash flow analysis. The course also introduces students to risk analysis, the capital asset pricing model, and investment analysis. Prerequisites: FIN 310 and Sophomore, Junior or Senior Standing; declared CoBPA majors only. F.S.

FIN 350. Financial Statement Analysis. 3 Credits.
Students interpret and evaluate financial statements used to report financial performance. Analysis incorporates accounting, financial, and economic models and data; and describes various reporting regulations, principles, rules, standards, and interpretations. The course includes an investigation of current issues and debates in financial statement reporting. Prerequisites: ACCT 301 and FIN 310; Sophomore, Junior or Senior Standing; declared CoBPA majors only. F.
FIN 360. Capital Market Financing and Investment Strategies. 3 Credits.
Covers analysis and procedures for implementing particular financing and investment plans in financial markets. Includes financing and investment through commercial banks, investment banks, pension funds, venture capital sources, insurance companies and limited partnerships. Prerequisites: ACCT 218 and FIN 310; Sophomore, Junior or Senior Standing; declared CoBPA majors only. F-S.

FIN 370. Student Investment Fund I. 1 Credit.
This is an introductory course to the Student Managed Investment Fund. It examines the issues involved in the management and investment strategies of a portfolio of financial assets. Students are required to attend Student Investment Fund meetings. Student members research prospective stocks, generate reports, make decisions to invest or liquidate, and execute the trades. Any recommendation to buy, sell, or retain a position in a security is presented to all student team members and to the Faculty Advisor. Repeatable up to a maximum of 3 credits. Prerequisite: Investments major or approval of instructor. Repeatable to 3 credits. F-S.

FIN 375. Lending and Liquidity Management. 3 Credits.
This course analyzes the short-term sources and uses of funds with primary emphasis on the management of liquidity in the context of a financial institution. The course also examines the risks and returns in a loan portfolio, particularly loans by financial institutions. Prerequisites: FIN 310; Junior or Senior Standing; declared CoBPA majors only. F.

FIN 397. Cooperative Education. 1-3 Credits.
On-the-job compensated work experience in various areas of Finance. May be repeated to a total of 6 credits. Prerequisites: ACCT 200, ACCT 201, ISBC 117, ECON 201, ECON 202, ECON 210, and approval by department. Repeatable to 6 credits. S/U grading. F-S,SS.

FIN 415. Fixed Income Analysis and Portfolio Management. 3 Credits.
This course covers characteristics and analysis of fixed-income (or debt) instruments. Types of debt securities examined primarily include corporate (commercial paper, notes, and fixed- and floating-rate bonds without and with various embedded options) and U.S. Government (Treasury bills, Treasury bonds without and with inflation protection, and Agency debt). Those enrolled in the class will be responsible for actively managing a live bond portfolio. Prerequisites: FIN 310, FIN 360 and FIN 370; Junior or Senior Standing; declared CoBPA majors only. S.

FIN 420. Investment Analysis and Portfolio Management. 3 Credits.
Comprehensive study of methods used to evaluate securities. Includes formulation of investment strategy and analysis, design of portfolios for classes of individual investors and institutions, fundamental analysis and portfolio performance evaluation. Extensive use of financial databases and software. Prerequisites: FIN 340 and FIN 360; Junior or Senior Standing; declared CoBPA majors only. F.

FIN 430. International Financial Management. 3 Credits.
Financial management implications of exchange risk exposure, accounting conventions and international constraints on capital flows. Other topics include multinational investment management and related financing problems, taxation and working capital management. Prerequisites: FIN 310 and Junior or Senior Standing; declared CoBPA majors only. S.

FIN 450. Financial Derivatives. 3 Credits.
Detailed analysis of major elements affecting market prices of options and futures contracts and analysis of optimal investment strategies involving these and other derivative instruments. Prerequisites: FIN 340 and FIN 360; declared CoBPA majors only. S.

FIN 470. Student Investment Fund II. 3 Credits.
The Student Managed Investment Fund is a sequence of courses whereby a select group of students manage a live portfolio. The course examines the issues involved in the management and investment strategies of a portfolio of financial assets. It focuses on asset allocation, portfolio monitoring and evaluation, portfolio rebalancing, and investment analysis. The students selected to manage the fund are responsible for the investment decisions involving the composition of the portfolio under the supervision of Finance department faculty. Student members establish the stock selection criteria, research the prospective stocks, generate reports, and make decisions to invest or liquidate, and execute the trades. Oral presentations are required. Repeatable to a maximum of 6 credits. Prerequisites: FIN 310, 340 and 370 and declared CoBPA majors only. Repeatable to 6 credits. F.

FIN 475. Cases in Managerial Finance. 3 Credits.
Introduces students to construction and utilization of financial management decision models using case study examples. Topics evaluated include working capital management, capital budgeting, cost of capital, capital structure, dividend policy, valuation, risk-return, and special topics of financial management. Students are required to develop original simulation models, prepare formal case reports, and orally and visually present their results. Prerequisites: FIN 340 and FIN 360; Junior or Senior Standing; declared CoBPA majors only. S.

FIN 491. Senior Topics in Finance. 3 Credits.
Multiple sections covering different topics may be offered in any one semester. Provides opportunities for in-depth study beyond that of regularly scheduled courses. May be seminars, workshops, or lectures. Repeatable to 6 credits. Prerequisites: FIN 310; consent of instructor; Junior or Senior Standing; declared CoBPA majors only. Repeatable to 6 credits. F-S.

FIN 492. Readings and Research in Finance. 1-3 Credits.
Designed for students with an interest in finance topics not covered in regularly scheduled courses. Repeatable to 6 credits. Prerequisites: FIN 310 and approval by department. Repeatable to 6 credits. F-S.

FIN 497. Internship in Finance. 1-3 Credits.
Guided practical experience in managerial finance, investment management, real estate, and insurance with public and private sector enterprises. Prerequisites: ACCT 200, ACCT 201, ISBC 117, ECON 201, ECON 202, ECON 210, and approval by department. Repeatable to 6 credits. S/U grading. F-S,SS.

Fine Arts (FA)

Courses

FA 150. Introduction to the Fine Arts. 3 Credits.
Introduction to the fundamental principles of the Fine Arts -- Visual Arts, Music, Theatre, and Dance -- followed by examples of the interaction of the arts in selected cultures from history and around the world and at a variety of campus arts events, in order to increase appreciation of the importance of the fine arts to the individual and community. F-S.

Forensic Science

http://www.und.edu/dept/forensic/

Ovtchinnikov, Stubbfield, and Mihelich (Director)
The undergraduate major in Forensic Science is designed to provide students from varied backgrounds and academic interests with a curriculum in the general forensic sciences. This curriculum will serve as a preparation for a baccalaureate-level career in criminalistics and law enforcement or as preparation for post-graduate education in the forensic sciences.

This interdisciplinary program draws on resources from the departments of Anatomy, Anthropology, Biochemistry and Molecular Biology, Biology, Chemistry, Clinical Laboratory Sciences, School of Communication, Criminal Justice, Mathematics, Philosophy and Religion, Physics, Psychology, and Sociology to provide students with sufficient background and baccalaureate-level preparation for several fields of the forensic sciences. To accommodate this breadth of fields and the variety of career outcomes that resolve from them, the Forensic Sciences curriculum is divided into two tracks, Evidence Technician and Evidence Analyst.

The Evidence Technician track is recommended for those interested in law enforcement careers involving evidence processing at crime scenes and only limited laboratory analysis. Students interested in acquiring a background in scientific analysis of evidence as a supplement to another major may prefer this track.

The Evidence Analyst track is recommended for those who desire a career in forensic laboratory analysis and access to careers that require similar analytical skills. Students interested in pursuing simultaneous science majors may also prefer this track. This track has a biology and molecular biology emphasis; students interested in chemistry should talk to the program director about course substitutions.
Admission requirements

Students may declare either track of the Forensic Science major at any time after admission to the University, provided that he or she has an overall grade point average (GPA) of 2.2 or higher. After joining the program, a 2.2 GPA must be maintained in the major and overall. Failure to maintain the appropriate GPA for two consecutive semesters will result in dismissal from the program.

College of Arts and Sciences

B.S. with a Major in Forensic Science

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Evidence Technician Track (see University ES listing).

69 Major Credits including:

Required Courses

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<tbody>
<tr>
<td>ANTH 345</td>
<td>Forensic Science</td>
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<tr>
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<td>BIOL 150</td>
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<td>CHEM 340</td>
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<td>SOC 326</td>
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<td>PHIL 251</td>
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Electives

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<td>PSYC 270</td>
<td>Abnormal Psychology</td>
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</table>

Total Credits: 69

III. Evidence Analyst Track: the following curriculum:

98 Major Credits including:

Required Courses

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<td>MLS 301</td>
<td>Immunology</td>
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Total Credits: 96

General Studies

The Bachelor of General Studies degree provides an option for advanced level students that facilitates study across academic disciplines. It is designed for students whose academic interest or career objectives require an individualized approach.

This program allows students to design and create their own program of study in conjunction with ongoing consultation with an academic advisor in the College of Arts & Sciences. It consists of Essential Studies requirements and major requirements.
The BGS degree is not obtainable as a double major or with another degree program. Upon return following completion of the degree students must earn 30 additional (new) credits for any additional degree sought.

**College of Arts and Sciences**

**B.G.S. with Major in General Studies**

Required: 125 credits (60 of which must be from a 4-year institution and 36 of which must be numbered 300 and above) including:

I. Essential Studies Requirements (see University ES listing).

II. A curriculum approved by the College of Arts & Sciences.

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**Geography and Geographic Information Science (Geog)**

http://www.arts-sciences.und.edu/Geography

Atkinson, Munski (Graduate Director), Niedzielski, Rundquist, Todhunter, Vandeberg (Chair) and Wang (Graduate GISc Certificate Director)

The Department of Geography & GISc offers a comprehensive education in Geography leading to the degree of Bachelor of Science in Geography. The Department also administers an interdisciplinary Environmental Studies program leading to the degree of Bachelor of Arts and Bachelor of Science in Environmental Studies. These degrees are awarded in the College of Arts and Sciences and focus on critical thinking, communication, knowledge and analysis related to these fields. The majors are flexible, and allow students to tailor their courses from many departments within the College and across the university. Students in these programs will be prepared for professional careers in government, industry or education in a wide variety of fields ranging from environmental science to planning and policy analysis. These programs also prepare students for graduate work.

Students in the Geography program have a strong focus on geospatial technologies related to the areas of human geography, physical geography, and geographic education. The Bachelor of Science degree has three options available with emphasis on: community and urban development, environmental geography and geographic education. In addition, the minor in geospatial technologies provides the student with the knowledge and hands-on learning to be successful in using tools such as GIS, remote sensing and global positioning systems (GPS) in many education and professional career paths. The geography minor is flexible and complements related coursework in many programs such as environmental studies, anthropology, atmospheric sciences, aviation, biology, business, communications, education, geology, history, international business, meteorology, public administration, sociology, space studies or sustainability studies.

Students in the Environmental Studies program can address the issues of the environment from the basic science, social science, or humanistic approach or a combination of these. The Bachelor of Arts is a liberal arts degree with a strong focus on the social sciences and humanities. The Bachelor of Science degree is more focused on science as it relates to environmental issues with the addition of social science and humanities perspectives.

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**Facilities**

The Department of Geography & GISc houses a state-of-the-art computer laboratory for work related to GIS, remote sensing, digital image processing, global positioning systems (GPS), mapping, spatial analysis and field methods. The Department also houses a physical geography lab and has a wide array of laboratory and field equipment, with a focus on tools needed for GPS mapping, water and soil sampling and analysis, and field spectroscopy.

**College of Arts and Sciences**

**B.S. with a Major in Geography**

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The following core curriculum courses for A and B options (22 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 151</td>
<td>Human Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 177</td>
<td>Quantitative Applications in Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 374</td>
<td>Historical Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 377</td>
<td>Conservation and Sustainable Use of Natural</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 374</td>
<td>Cartography and Visualization</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 454</td>
<td>Introduction to Geographic Information Systems(GIS)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits** 22

* Capstone Course

III. Select one of the following options:

**A: Community and Urban Development Emphasis**

This program provides an overview of geography as well as a thorough introduction to community and urban development. It is intended for students wishing to pursue graduate work or entry-level jobs in community development, economic development, urban planning, land use planning, transportation, or tourism.

**Required**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 352</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 457</td>
<td>Urban Geography and Planning</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 459</td>
<td>Community Development</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives** 5

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 250</td>
<td>Introduction to Geopolitics</td>
<td></td>
</tr>
<tr>
<td>GEOG 252</td>
<td>Geography of North America I</td>
<td></td>
</tr>
<tr>
<td>GEOG 253</td>
<td>Geography of North Dakota</td>
<td></td>
</tr>
<tr>
<td>GEOG 300</td>
<td>Special Topics in Geography</td>
<td></td>
</tr>
<tr>
<td>GEOG 322</td>
<td>Environmental Hazards</td>
<td></td>
</tr>
<tr>
<td>GEOG 374</td>
<td>Environmental Remote Sensing and Spatial Analysis</td>
<td></td>
</tr>
<tr>
<td>GEOG 378</td>
<td>Global Positioning Systems: Applications and Theory</td>
<td></td>
</tr>
<tr>
<td>GEOG 397</td>
<td>Cooperative Education</td>
<td></td>
</tr>
<tr>
<td>GEOG 452</td>
<td>Selected Topics in Economic Geography</td>
<td></td>
</tr>
<tr>
<td>GEOG 453</td>
<td>Historical Geography</td>
<td></td>
</tr>
<tr>
<td>GEOG 455</td>
<td>Geopolitics</td>
<td></td>
</tr>
<tr>
<td>GEOG 459</td>
<td>Population Geography</td>
<td></td>
</tr>
<tr>
<td>GEOG 463</td>
<td>Regional Geography</td>
<td></td>
</tr>
<tr>
<td>GEOG 476</td>
<td>Selected Topics in Geographic Information Systems</td>
<td></td>
</tr>
</tbody>
</table>

**Required in other departments** 12

**Total Credits** 26

* Electives chosen in consultation with the faculty adviser (at least 5 credits)
** Any combination of courses from the following fields: Economics, Finance, Public Administration, Anthropology, Sociology, History, and other social sciences.

**B: Environmental Geography Emphasis**

This program provides an overview of geography and an introduction to the concepts and methods used in environmental management. It is intended for students wishing to pursue graduate work or a professional career in government, industry, or education in a wide variety of environmental fields.

**Elective systematic courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 134</td>
<td>Introduction to Global Climate</td>
<td></td>
</tr>
<tr>
<td>&amp; 134L</td>
<td>and Introduction to Global Climate Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOG 334</td>
<td>Climatology</td>
<td></td>
</tr>
<tr>
<td>GEOG 322</td>
<td>Environmental Hazards</td>
<td></td>
</tr>
</tbody>
</table>
**C: Geographic Education Emphasis (Teacher Licensure)**

Through a partnership with the College of Education and Human Development and the Department of Teaching and Learning, students may seek secondary licensure in Geography. This program provides a comprehensive background to geography. It is designed to prepare the student with the geography education necessary for a middle school or secondary school teaching career. The following program of study must be completed:

**I. Essential Studies Requirements (see University ES guidelines and course listings).**

**II. Geographic Education Program of Study:**

*Geographic Education Core (26 credits):*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 121</td>
<td>Global Physical Environment &amp; Global Physical Environment Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 151</td>
<td>Human Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 271</td>
<td>The Power of Maps</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 352</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 377</td>
<td>Quantitative Applications in Geography &amp; Spatial Analysis Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 386</td>
<td>Geography Education Field Placement</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 419</td>
<td>Methods and Materials of Teaching Middle and Secondary School in Geographic Education</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 454</td>
<td>Conservation and Sustainable Use of Natural Resources</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 26

*Elective systematic courses chosen in consultation with the faculty adviser (at least 8 credits).

**III. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development p. 615 for admission and licensing requirements.)**

**IV. The program in Secondary Education, to include:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 386</td>
<td>Field Experience (Optional)</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 419</td>
<td>Methods and Materials of Teaching Middle and Secondary School in Geographic Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 432</td>
<td>Learning Environments</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>16</td>
</tr>
<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credits 39

Geography majors seeking secondary licensure must have a geography education advisor in the Geography Department and an advisor in the Department of Teaching and Learning.

* T&L 390 Special Topics, may be taken as an elective.

**B.A. with a Major in Environmental Studies**

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

**I. Essential Studies Requirements (see University ES guidelines and course listings).**

**II. The Following Curriculum (45 Major Credits)**

**Core Required Courses (21 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Concepts of Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111L</td>
<td>Concepts of Biology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115L</td>
<td>Introductory Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 121</td>
<td>Global Physical Environment</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 121L</td>
<td>Global Physical Environment Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 454</td>
<td>Conservation and Sustainable Use of Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 253</td>
<td>Environmental Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 21
or PHIL 250  Ethics in Engineering and Science

Techniques and Methods (6 credits from the list below, including statistics)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 350</td>
<td>Ethnographic Methods</td>
</tr>
<tr>
<td>GEOG 274</td>
<td>Introduction to Geospatial Technologies</td>
</tr>
<tr>
<td>GEOG 471</td>
<td>Cartography and Visualization</td>
</tr>
<tr>
<td>GEOG 471L</td>
<td>Cartography and Visualization Laboratory</td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Geographic Information Systems (GIS)</td>
</tr>
<tr>
<td>GEOG 474L</td>
<td>GIS Laboratory</td>
</tr>
<tr>
<td>SOC 323</td>
<td>Sociological Research Methods</td>
</tr>
</tbody>
</table>

Statistics (one of the following options):

- GEOG 377  Quantitative Applications in Geography 3-4
- BIOL 343L  Applied Statistics in Biology 3
- or SOC 326  Sociological Statistics
- or PSYC 241  Introduction to Statistics

Natural Systems (6 credits from the list below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
</table>
| ANTH 420 | Archaeological Origins of Plant and Animal Use 3
| ESSP 320 | Land and Water Sustainability 3
| ESSP 333 | Oceanography 3
| GEOG 134 | Introduction to Global Climate 3
| GEOG 334 | Climatology 3
| GEOG 421 | Selected Topics in Physical Geography 3
| GEOL 101 | Introduction to Geology 3
| GEOL 103 | Introduction to Environmental Issues 3
| GEOL 205 | Surviving on Planet Earth 3
| GEOL 322 | Geology, Society, and the Environment 3
| GEOL 342 | Conservation and Environmental Hydrology 3

Social Science and Policy (6 credits from the list below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
</table>
| COMM 300 | Communication and Society 3
| ESSP 460 | Global Environmental Policy 3
| GEOG 322 | Environmental Hazards 3
| GEOG 455 | Geopolitics 3
| GEOG 457 | Urban Geography and Planning 3
| GEOG 459 | Population Geography 3
| N&D 335 | World Food Patterns 3
| POLS 250 | Introduction to Public Administration 3
| POLS 432 | Public Policy Making Process 3
| SOC 331 | Community Sociology 3
| SOC 437 | Population 3
| TECH 300 | Technology and Society 3

Humanities (6 credits from the list below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
</table>
| ENGL 227 | Introduction to Literature and Culture 3
| ENGL 308 | The Art of Writing Nonfiction |
| ENGL 369 | Literature and Culture 3
| PHIL 430 | Philosophy of Science and Technology 3
| PHIL 450 | Philosophy, Economics, and Politics |
| PHIL 451 | Citizenship and Political Participation 3
| RELS 203 | World Religions 3

B.S. with a Major in Environmental Studies

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings).

II. The Following Curriculum (45 Major Credits)

Core Required Courses (24 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150</td>
<td>General Biology I 3</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory 1</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I 3</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory 1</td>
</tr>
</tbody>
</table>

Environmental and Natural Resource Economics (3 credits from the list below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 362</td>
<td>Environmental and Natural Resource Economics 3</td>
</tr>
</tbody>
</table>

B.S. with a Major in Environmental Studies (Continued)

Techniques and Methods (6 credits from the list below, including statistics)

GEOG 121  Global Physical Environment 3
GEOG 454  Conservation and Sustainable Use of Natural Resources 3
MATH 146  Applied Calculus I 3
PHIL 253  Environmental Ethics 3
PHIL 250  Ethics in Engineering and Science 3
BIOI 151  General Biology II & 151L and General Biology II Laboratory 3
or CHEM 122 & 122L and General Chemistry II Laboratory 3

Natural Systems (9 credits from the list below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 332</td>
<td>General Ecology 3</td>
</tr>
<tr>
<td>BIOL 332L</td>
<td>Gen Ecology Lab 1</td>
</tr>
<tr>
<td>BIOL 433</td>
<td>Aquatic Ecology 3</td>
</tr>
<tr>
<td>BIOL 439</td>
<td>Conservation Biology 3</td>
</tr>
<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry 3</td>
</tr>
<tr>
<td>CHEM 333L</td>
<td>Analytical Chemistry Laboratory 1</td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I 3</td>
</tr>
<tr>
<td>CHEM 341L</td>
<td>Organic Chemistry I Laboratory 1</td>
</tr>
<tr>
<td>CHEM 342</td>
<td>Organic Chemistry II 3</td>
</tr>
<tr>
<td>CHEM 342L</td>
<td>Organic Chemistry II Laboratory 1</td>
</tr>
<tr>
<td>ESSP 320</td>
<td>Land and Water Sustainability 3</td>
</tr>
<tr>
<td>ESSP 333</td>
<td>Oceanography 3</td>
</tr>
<tr>
<td>GEOG 134</td>
<td>Introduction to Global Climate 3</td>
</tr>
<tr>
<td>GEOG 334</td>
<td>Climatology 3</td>
</tr>
<tr>
<td>GEOG 421</td>
<td>Selected Topics in Physical Geography 3</td>
</tr>
</tbody>
</table>
### Minor in Geography

Required 20 credits including:

- GEOG 121 Global Physical Environment and Global Physical Environment Laboratory 4
- GEOG 151 Human Geography 3
- GEOG 161 World Regional Geography 3
- Electives 10

Total Credits 20

Students must choose a minimum of 10 credits from one or a combination of concentrations, selected with approval of a geography adviser.

### Minor in Geospatial Technologies

This is a 21-credit minor. The courses to be included are as follows (all are existing courses taught on a regular basis as part of normal faculty loads with the exception of GEOG 274, which is new but will be part of a faculty member’s normal load):

- GEOG 271 The Power of Maps 3
- GEOG 274 Introduction to Geospatial Technologies 3
- GEOG 374 Environmental Remote Sensing 2
- GEOG 374L Environmental Remote Sensing Laboratory 1
- GEOG 471 Cartography and Visualization 2
- GEOG 471L Cartography and Visualization Laboratory 1
- GEOG 474 Introduction to Geographic Information Systems (GIS) 2
- GEOG 474L GIS Laboratory 1
- GEOG 475 Digital Image Processing 3
- GEOG 476 Selected Topics in Geographic Information Systems 3

Total Credits 21

The geography courses that may be used to satisfy the 4-credit Essential Studies laboratory science requirement are Geography 121 and 134.

Geography courses that may be used to satisfy the 9-credit Essential Studies social science requirement include: Geography 151, 161 and 262.

### Courses

- **GEOG 121. Global Physical Environment. 3 Credits.**
  A study of the pattern of distribution of the physical elements of the global environment. The origin and characteristics of the terrestrial grid, earth-space relations, climate, landforms, vegetation, and soils. F,S,SS.
- **GEOG 121L. Global Physical Environment Laboratory. 1 Credit.**
  A basic environmental science laboratory to complement Geography 121. F,S,SS.
- **GEOG 134. Introduction to Global Climate. 3 Credits.**
  An introduction to the global climate, emphasizing atmospheric processes, weather and climate elements, and climate change. Emphasis is placed upon the factors that control climate and climatic distributions. S.
- **GEOG 134L. Introduction to Global Climate Laboratory. 1 Credit.**
  A basic physical science laboratory focused upon specific atmospheric-climatic phenomenon; wet and dry lab experiments, plus written lab exercises. S.
- **GEOG 151. Human Geography. 3 Credits.**
  A systematic analysis of people's cultural regions including settlement patterns and change via migration and diffusion. F,S.
- **GEOG 161. World Regional Geography. 3 Credits.**
  Development of the concept of region with analysis of the relationship of physical and cultural features to the contemporary world situation. F,S.
- **GEOG 271. The Power of Maps. 3 Credits.**
  The Power of Maps is an introduction to maps and cartography, with an emphasis on the role of maps in conveying information and solving problems. Prerequisites: GEOG 121 and GEOG 161 or consent of instructor. F, even years.
- **GEOG 274. Introduction to Geospatial Technologies. 3 Credits.**
  This course will introduce students to the fundamentals of geospatial technologies, with an emphasis on the role of geospatial data in solving problems. Prerequisites: GEOG 121 and GEOG 161 or consent of instructor. F, even years.
- **GEOG 277. Environmental Remote Sensing. 2 Credits.**
  A thorough examination of the principles and applications of remote sensing for environmental monitoring and management. Prerequisites: GEOG 121 and GEOG 161 or consent of instructor. F.
- **GEOG 278. Introduction to Geographic Information Systems (GIS). 2 Credits.**
  An introduction to geographic information systems, including data collection, data management, and data analysis. Prerequisites: GEOG 121 and GEOG 161 or consent of instructor. F.
A variable credit course with amount of credit depending upon the extent of the course. Prerequisites: 30 credits completed and a minimum GPA of 2.75 or consent of instructor. Repeatable to 9 credits. Prerequisite: GEOG 151 or equivalent or consent of instructor. On demand.

GEOG 357. Geopolitics. 3 Credits.
The core components of population change (fertility, mortality, migration) are explored in the context of contemporary and historical population debates. The course focuses on understanding and critically assessing global, regional, national, and local population trends and issues. Topics include the impact of population growth, spatial diffusion processes, migration trends and theories, aging of societies, and population policies. S, even years.

GEOG 358. Urban Geography & Planning. 3 Credits.
This course examines the historical evolution, conceptual framework, and implementation of community development. Students will be introduced to a broad range of community development issues from a geographical perspective with emphasis on local and statewide scales of study. Prerequisite: GEOG 151 or consent of instructor. F.

GEOG 359. Population Geography. 3 Credits.
The core components of population change (fertility, mortality, migration) are explored in the context of contemporary and historical population debates. The course focuses on understanding and critically assessing global, regional, national, and local population trends and issues. Topics include the impact of population growth, spatial diffusion processes, migration trends and theories, aging of societies, and population policies. S, even years.

GEOG 360. Community Development. 3 Credits.
This course examines the historical evolution, conceptual framework, and implementation of community development. Students will be introduced to a broad range of community development issues from a geographical perspective with emphasis on local and statewide scales of study. Prerequisite: GEOG 151 or consent of instructor. F.

GEOG 361. Community Development. 3 Credits.
This course examines the historical evolution, conceptual framework, and implementation of community development. Students will be introduced to a broad range of community development issues from a geographical perspective with emphasis on local and statewide scales of study. Prerequisite: GEOG 151 or consent of instructor. F.

GEOG 362. Geography of North America II. 3 Credits.
A regional analysis of the physical, cultural, and economic features of a selected region or group of regions within North America. May be repeatable to six credits if a different region is examined. Prerequisite: GEOG 262 or consent of instructor. On demand.

GEOG 363. Regional Geography. 2-3 Credits.
A regional and topical analysis of the physical and cultural features with emphasis on one continent or region. May be repeated up to nine credits provided different regions and approaches are involved. Repeatable to 9 credits. S.

GEOG 364. Cartography and Visualization. 2 Credits.
This course examines the art, science, and technology of cartography and visualization. It familiarizes students with basic cartographic principles and with GIS, both of which are applicable to a wide range of professional fields and academic disciplines. Students learn how maps are designed and used to accurately represent and effectively communicate spatial phenomena and relationships. The course also includes a discussion of selection of proper thematic mapping techniques. Corequisite: GEOG 471L. F.

GEOG 365. Cartography and Visualization Laboratory. 1 Credit.
Students apply concepts learned in GEOG 471 to produce accurate and well-designed maps using GIS software. Lab activities hone the ability of students to be informed producers and consumers of maps and provide hands-on experience that demonstrates how maps function as a communicative visual medium. Corequisite: GEOG 471. F.

GEOG 366. Introduction to Geographic Information Systems (GIS). 2 Credits.
An introductory course that examines the digital representation, manipulation, and analysis of geographic data, with emphasis on the analytical capabilities that GIS brings to bear on the solution of geographic problems. Prerequisites: GEOG 471 and 471L or equivalent or consent of instructor. Corequisite: GEOG 474L. F.S.

GEOG 367. GIS Laboratory. 1 Credit.
Hands-on application of theory and methods associated with digital spatial data representation, manipulation, and analysis. Corequisite: GEOG 474, F.S.

GEOG 368. Digital Image Processing. 3 Credits.
A course focused on the concepts and principles involved in the use of digital remotely sensed data as they are applied to environmental monitoring and natural resource management. Emphasis is placed on algorithm development and ‘hands-on’ application of digital techniques to select imagery. Prerequisites: GEOG 374 and 374L. S.

GEOG 369. Selected Topics in Geographic Information Systems. 3 Credits.
An examination of an advanced physical geography topic chosen from field methods, biogeography, human impact on the environment, physiography, or others. Repeatable to nine credits if different topics are examined. Prerequisite: GEOG 121 or consent of instructor. Repeatable to 9 credits. F.S.

GEOG 370. Conservation and Sustainable Use of Natural Resources. 3 Credits.
Geographic principles applied to the analysis of natural resources and their efficient utilization. Emphasis is on sustainable development. S.

GEOG 371. Geopolitics. 3 Credits.
Geographic analysis of the global political system and the significance of the nation-state, intergovernmental organizations, globalization, free trade, and terrorism with consideration of the broad political, social cultural, and economic contexts of world disputes. Prerequisite: GEOG 250 or consent of instructor. On demand.

GEOG 372. Urban Geography and Planning. 3 Credits.
This course examines the internal workings of cities from political, economic, and social perspectives. Geographic approaches to urban analysis are discussed, as are various methods for contemporary urban planning. Students learn to view the city as a geographic phenomenon created by human effort. S.

GEOG 373. Quantitative Applications in Geography. 2 Credits.
Application of statistical and mathematical techniques to research topics in geography. Prerequisite: MATH 103 or consent of instructor. F.

GEOG 374. Spatial Analysis Laboratory. 1 Credit.
Practical applications of statistical and mathematical techniques for geographic problems. Students work on projects which involve solving problems by spatial-oriented computations. Use of relevant statistical programs on computers are emphasized. Prerequisite: MATH 103. Corequisite: GEOG 377. F.

GEOG 375. Global Positioning Systems: Applications and Theory. 2 Credits.
This course examines the equipment, procedures, and techniques related to GPS technology, as well as its integration with Geographic Information Systems. Foci include the fundamentals of satellite navigation, the history of GPS, and applications related to mapping and analysis in the environmental sciences. Strong emphasis is placed on providing hands-on experience. S, even years.

GEOG 376. Geography Education Field Placement. 1-3 Credits.
A practical work experience with an employer closely associated with geography. May be repeated to a maximum of 6 credits. Prerequisites: 60 credits completed and a minimum GPA of 2.75 or consent of Department Co-op Coordinator and Chair. Repeatable to 6 credits. S/U grading. F.S.SS.

GEOG 377. Digital Image Processing. 3 Credits.
The course examines the digital representation, manipulation, and analysis. Corequisite: GEOG 474. F.S.

GEOG 378. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. On demand.

GEOG 379. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. On demand.

GEOG 380. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. On demand.

GEOG 381. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. On demand.
GEOG 497. Geography Internship. 1-3 Credits.
Must involve work of a geographical nature performed as an unpaid volunteer to a PVO, NGO, youth organization, service organization or other not-for-pay jobs either on or off campus. May be repeated to a maximum of three credit hours. Prerequisite: Geography major or minor or consent of the supervising faculty member. Repeatable to 3 credits. S/U grading. F.S.SS.

### Harold Hamm School of Geology and Geological Engineering (Geol and GeoE)

http://engineering.und.edu/geology-and-geological-engineering/
Forsman, Gerla, Gosnold, Hartman, Ho, Mahmood, Matheney, Nordeng, Perkins, Putkonen and Wang

The Harold Hamm School of Geology and Geological Engineering offers Bachelor of Science degrees in Geology, Geological Engineering, Environmental Geoscience, and Earth Science, the Master of Arts and Master of Science degrees in Geology, the Master of Science degree in Geological Engineering, the Doctor of Philosophy degree in Geological Engineering, and the Doctor of Philosophy degree in Geology. The goals of the undergraduate programs are to provide professional preparation for majors in the geosciences and engineering and to provide guidance to non-majors seeking to gain a greater understanding of Earth and planetary environments and resources. Active student organizations, Beta Zeta Chapter of Sigma Gamma Epsilon (the national Earth science honorary society), The Association of Engineering Geologists (AEG), Society of Exploration Geophysicists (SEG), Society of Petroleum Engineers (SPE), and The Association of University of North Dakota Geologists (AUG) provide academic and social opportunities for students including: guest speakers, outings, field trips, research experience, scholarships, and thesis and dissertation research support. The Harold Hamm School of Geology and Geological Engineering actively supports its LEEPS (Leading Edge of Earth and Planetary Sciences) lecture series, which hosts creative individuals in seminars, luncheons, and other activities for the benefit of the public, faculty, and our students.

### Facilities

The Harold Hamm School of Geology and Geological Engineering is housed in Leonard Hall, a facility specifically designed for Geology and Geological Engineering. Leonard Hall facilities are superior to those in most geoscience departments at universities similar in size and mission to UND and include a variety of equipment for teaching and research in field and laboratory areas such as geomorphology, hydrogeology, geophysics, stratigraphy, paleontology, mineralogy, petrology, petroleum geology, and geological engineering. The North Dakota Geological Survey’s Wilson M. Laird Core and Sample Library is located directly across the street from Leonard Hall and houses approximately 80 miles of cores and approximately 40,000 boxes of drill cuttings of the Williston Basin, as well as an extensive collection of water well samples and cores. The F. D. Holland Jr. Geology Library, located on the third floor of Leonard Hall, is one of the largest geoscience libraries in the upper Midwest.

For more information about our department and facilities, please visit our website at: http://engineering.und.edu/geology-and-geological-engineering/.

### Undergraduate Programs

Four degrees are offered: the Bachelor of Science in Geology, Bachelor of Science in Earth Science, Bachelor of Science in Geological Engineering and the Bachelor of Science in Environmental Geoscience in the College of Engineering and Mines.

### Geology

Bachelor of Science (B.S) and Bachelor of Earth Science (B.S) degrees in Geology are taught in the School, and the degrees are awarded through the College of Engineering and Mines.

A program that focuses on the scientific study of the earth; the forces acting upon it; and the behavior of the solids, liquids and gases comprising it. Includes instruction in historical geology, geomorphology, and sedimentology, the chemistry of rocks and soils, stratigraphy, mineralogy, petrology, geostatistics, volcanology, glaciology, geophysical principles, and applications to research and industrial problems.

The students graduating with a Bachelor of Science in Geology typically find employment with the North Dakota oil industry, private sector, consulting firms, environmental remediation, municipal or government institutions, or continue to graduate school. The degree in Earth Science provides slightly more flexibility in electives and is often chosen by students pursuing dual-degrees.

### Environmental Geoscience

The B.S. in Environmental Geoscience, administered by the College of Engineering & Mines, combines a broad foundation in geology with a thorough background in related sciences and mathematics. This degree provides the graduate with more applied and interdisciplinary science skills than the Geology B.S. or Earth Science B.S. Although not an engineering degree, graduates with a B.S. in Environmental Geoscience are qualified to work in various environmental fields, including field monitoring, remediation of contaminated sites, evaluation of natural hazards, site selection, waste disposal, and water resources. Continuing at the graduate level at UND or other institutions is another option, with opportunities to branch into fields such as geography, ecology, hydrology, and environmental policy. The program includes electives in biology, chemistry, geological engineering, law, and Earth system science. Completion of a summer geology field course, although strongly recommended, is not required for graduation.

### Geological Engineering

The Geological Engineering curriculum gives the student a strong background in engineering and geology that serves as a foundation for meaningful professional practice. Geological engineering encompasses:

1. exploration and extraction of mineral and energy resources;
2. geomechanics/geotechnics;
3. hydrogeology and water resources;
4. reclamation and contaminant remediation;
5. environmental site assessment; and
6. natural hazard investigation.

These areas of expertise span the gap between civil, mining, environmental engineering and geology. To meet these demands, the curriculum contains a broad background in the physical and social sciences, humanities, communications, mathematics, geology, and engineering topics. The program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org/).

Courses in the curriculum are arranged and integrated to provide the student with progressive preparation for engineering evaluation and design. To facilitate the transition from student to professional, the senior year has a capstone experience that incorporates student creativity and sociological and engineering criteria into a major design project. As the demand for mineral, energy, and water resources increases and population growth and urbanization place a greater strain on the environment, the nation and world will need engineers with a thorough knowledge of geologic materials, processes, and history.

The goal of the geological engineering program at the University of North Dakota is to provide students with the engineering skills and geological expertise necessary to assure that geological, social, and environmental factors are incorporated in the design, construction, operation, and maintenance of engineered structures and systems within their natural setting. Through its strong environmental emphasis, the department strives to develop in its engineering graduates keen insight and abilities to design an environmentally sound and sustainable future for humanity.

To achieve this goal, the School has the following objectives for its engineering graduates:

- Program graduates shall be able to pursue satisfying careers in geological engineering or related fields that contribute to the well-being of society.
- As professionals, program graduates shall enhance productivity through technical innovations, improve communication skills, and acquire new knowledge, including licensure if it is required to accomplish their goals.
In addition, our program has a petroleum option, which is designed to prepare students for possible employment in the petroleum industry, while continuing to provide a broad geological engineering background for career flexibility. The graduate pursuing this emphasis will have a B.S. in Geological Engineering and can report that they have completed the petroleum option requirements.

B.S. in Geological Engineering

B.S. in Geology

B.S. in Environmental Geoscience

B.A. with Major in Geology

Teacher Certification

College of Engineering and Mines

B.S. in Geology

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies requirements (see University ES listing).

II. The following curriculum:

Major hours

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td>4</td>
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<tr>
<td>&amp; 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 102</td>
<td>The Earth Through Time</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 102L</td>
<td>and The Earth Through Time Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 256</td>
<td>Critical Thinking in the Geosciences</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 311</td>
<td>Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 318</td>
<td>Mineralogy</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 320</td>
<td>Petrology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 330</td>
<td>Structural Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 356</td>
<td>Geoscience Lectures</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 411</td>
<td>Sedimentology and Stratigraphy</td>
<td>5</td>
</tr>
<tr>
<td>GEOL 420</td>
<td>Geology Capstone</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 421</td>
<td>Seminar I</td>
<td>1</td>
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<tr>
<td>GEOL 422</td>
<td>Seminar II</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 487</td>
<td>Research I</td>
<td>1</td>
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<tr>
<td>GEOL 488</td>
<td>Research II</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 494</td>
<td>Senior Thesis</td>
<td>1</td>
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<tr>
<td>Field Geology (Summer; not available at UND)</td>
<td>6-7</td>
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Select two of the following:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>GEOL 321</td>
<td>Geochemistry</td>
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<td>GEOL 414</td>
<td>Applied Geophysics</td>
</tr>
<tr>
<td>GEOL 415</td>
<td>Introduction to Paleontology</td>
</tr>
<tr>
<td>GEOE 417</td>
<td>Hydrogeology</td>
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Required in other departments

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>and General Chemistry II</td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
</tr>
<tr>
<td>&amp; MATH 166</td>
<td>and Calculus II</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>College Physics I</td>
</tr>
<tr>
<td>&amp; PHYS 211L</td>
<td>and College Physics I Laboratory</td>
</tr>
<tr>
<td>or PHYS 251</td>
<td>University Physics I</td>
</tr>
<tr>
<td>&amp; PHYS 251L</td>
<td>and University Physics I</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>College Physics II</td>
</tr>
<tr>
<td>&amp; PHYS 212L</td>
<td>and College Physics II Laboratory</td>
</tr>
<tr>
<td>or PHYS 252</td>
<td>University Physics II</td>
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<tr>
<td>&amp; PHYS 252L</td>
<td>and University Physics II</td>
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<tbody>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
</tr>
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</table>

Departmentally approved courses in engineering, mathematics, foreign language, and other fields of student interest

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
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<tr>
<td>CHEM 241</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>GEOE 203</td>
<td>Earth Dynamics</td>
</tr>
<tr>
<td>&amp; 203L</td>
<td>and Earth Dynamics Laboratory</td>
</tr>
<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
</tr>
</tbody>
</table>

Total Credits

102-105

Teacher Certification

Students seeking secondary teacher certification in Geology must complete the Department of Teaching and Learning Requirements in Secondary Education. Students seeking certification should follow the curriculum for the B.S. in Geology and select Statistics (PSYC 241 Introduction to Statistics, MATH 321 Applied Statistical Methods) rather than MATH 265 Calculus III or Computer Science. The 24 additional hours in science, computer science, statistics, engineering, mathematics, or a foreign language must include each of the following: at least one course in Biology with lab equaling 4 credits, Atmospheric Sciences, and Astronomy.

Geology majors seeking secondary certification must have an adviser both in the Department of Geology and Geological Engineering and in the Department of Teaching and Learning. Formal admission to Teacher Education is required and is normally sought while the student is enrolled in T&L 250 Introduction to Education (see Department of Teaching and Learning (p. 241) listing).

B.S. in Geological Engineering

Required: 128 credits including:

I. Essential Studies Requirements (see University ES listing).

II. The following curriculum:

All students must meet each semester with their academic advisor.

Freshman Year

First Semester

<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
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<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>GEOE 203</td>
<td>Earth Dynamics</td>
<td>4</td>
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<td>&amp; 203L</td>
<td>and Earth Dynamics Laboratory</td>
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<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
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Credits

17
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<tr>
<td>ENGR 201</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>GEOE 301 &amp; 301L</td>
<td>Petrophysics and Petrophysics Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251 &amp; PHYS 251L</td>
<td>University Physics I and</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
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<tr>
<td>PHYS 252 &amp; PHYS 252L</td>
<td>University Physics II and</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 122 &amp; 122L</td>
<td>General Chemistry II and General Chemistry II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
<td>3</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Second Semester</td>
<td></td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 203</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EE 206 or ENGR 202</td>
<td>Circuit Analysis or Dynamics</td>
<td>3</td>
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<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
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<tr>
<td>GEOL 330</td>
<td>Structural Geology</td>
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<td><strong>Credits</strong></td>
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<td><strong>Junior Year</strong></td>
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<tr>
<td>CE 306 or ME 306</td>
<td>Fluid Mechanics or Fluid Mechanics</td>
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<tr>
<td>ENGR 460</td>
<td>Engineering Economy</td>
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<tr>
<td>GEOE 417</td>
<td>Hydrogeology</td>
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<td></td>
<td>Arts &amp; Humanities Elective</td>
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<tr>
<td>ECON 210 or MATH 321</td>
<td>Introduction to Business and Economic Statistics or Applied Statistical Methods</td>
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<tr>
<td>Sumner</td>
<td>Geological Engineering Field Camp (South Dakota School of Mines and Technology Black Hills Field Camp)</td>
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<tr>
<td><strong>Credits</strong></td>
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<td>Senior Year</td>
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<tr>
<td>GEOL 414</td>
<td>Applied Geophysics</td>
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<tr>
<td>GEOE 455 &amp; 455L</td>
<td>Geomechanics II and Geomechanics Laboratory</td>
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<tr>
<td>GEOE 484</td>
<td>Geological Engineering Design</td>
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<td>Social Science Elective</td>
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<td>Technical Elective</td>
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<tr>
<td>Second Semester</td>
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<tr>
<td>CHE 340 or PHIL 250</td>
<td>Professional Integrity in Engineering or Ethics in Engineering and Science</td>
<td>3</td>
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<tr>
<td>GEOE 485</td>
<td>Geological Engineering Design</td>
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<td>Technical Elective</td>
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<tr>
<td>GEOE 422</td>
<td>Seminar II</td>
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<td></td>
<td>Arts and Humanities Elective</td>
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<tr>
<td><strong>Credits</strong></td>
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**Approved Technical Electives for Geological Engineering**

<table>
<thead>
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<th>Course</th>
<th>Title</th>
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<tr>
<td>CE 414</td>
<td>Foundation Engineering</td>
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</tr>
<tr>
<td>CE 421</td>
<td>Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>CE 431</td>
<td>Environmental Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CE 432</td>
<td>Environmental Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 302</td>
<td>Reclamation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 351</td>
<td>Petroleum Development Engr</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 418</td>
<td>Hydrogeological Methods</td>
<td>2</td>
</tr>
<tr>
<td>GEOE 419</td>
<td>Groundwater Monitoring and Remediation</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 425</td>
<td>Design Hydrology for Wetlands</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 427</td>
<td>Groundwater Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 493</td>
<td>Selected Topics in Geological Engineering</td>
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</tr>
<tr>
<td>GEOE 311</td>
<td>Geomorphology</td>
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<tr>
<td>GEOE 321</td>
<td>Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOE 407</td>
<td>Petroleum Geology</td>
<td>3</td>
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<tr>
<td>GEOE 491</td>
<td>Geologic Problems (only section)</td>
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<tr>
<td>PTRE 311</td>
<td>Petroleum Fluid Properties</td>
<td>3</td>
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<tr>
<td>PTRE 401</td>
<td>Well Logging</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 411</td>
<td>Drilling Engineering</td>
<td>3</td>
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<tr>
<td>PTRE 421</td>
<td>Production Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 431</td>
<td>Reservoir Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

Students may petition the Geological Engineering Curriculum Committee (GECC) to use GEOE 397 Cooperative Education, for up to three credits of technical elective credits with the following requirement:

1. Students must get approval in advance from the GECC and the Department Cooperative Coordinator.
2. The first cooperative experience may receive up to one credit of technical elective credit.
3. The second cooperative experience may receive up to two credits of technical elective credit.

**Petroleum Option**

The program has a petroleum option, which is designed to prepare students for possible employment in the petroleum industry, while continuing to provide a broad geological engineering background for career flexibility. The graduate pursuing this emphasis will have a B.S. in Geological Engineering and can report that they have completed the petroleum engineering option requirements.

**B.S. in Environmental Geoscience**

The B.S. in Environmental Geoscience, administered by the College of Engineering and Mines, combines a broad foundation in geology with a thorough background in related sciences and mathematics. This degree provides the graduate with more applied and interdisciplinary science skills than the Geology B.S. or B.A. Although not an engineering degree, graduates with a B.S. in Environmental Geoscience are qualified to work in various environmental fields, including field monitoring, remediation of contaminated sites, evaluation of natural hazards, site selection, waste disposal, and water resources. Continuing at the graduate level at UND or other institutions is another option, with opportunities to branch into fields such as geography, ecology, hydrology, and environmental policy. The program includes electives...
in biology, chemistry, geological engineering, law, and Earth system science. Completion of a summer geology field course, although strongly recommended, is not required for graduation.

Required 125 credits, including:

I. Essential Studies Requirements (see University ES listing).

II. The following Core Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td>4</td>
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<tr>
<td>&amp; 101L</td>
<td>Introduction to Geology Laboratory</td>
<td></td>
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<tr>
<td>Or</td>
<td>GEOE 203</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 203L</td>
<td>Earth Dynamics</td>
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</tr>
<tr>
<td>&amp; 102L</td>
<td>The Earth Through Time</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 220</td>
<td>Computer Applications in Geology and Environmental Science</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 256</td>
<td>Critical Thinking in the Geosciences</td>
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</tr>
<tr>
<td>GEOL 311</td>
<td>Geomorphology</td>
<td>4</td>
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<tr>
<td>GEOL 318</td>
<td>Mineralogy</td>
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<tr>
<td>GEOL 321</td>
<td>Geochemistry</td>
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</tr>
<tr>
<td>GEOL 322</td>
<td>Geology, Society, and the Environment</td>
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</tr>
<tr>
<td>GEOL 342</td>
<td>Conservation and Environmental Hydrology</td>
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<tr>
<td>GEOL 356</td>
<td>Geoscience Lectures</td>
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<tr>
<td>GEOL 414</td>
<td>Applied Geophysics</td>
<td>3</td>
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<tr>
<td>GEOL 420</td>
<td>Geology Capstone</td>
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<tr>
<td>GEOL 421</td>
<td>Seminar I</td>
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<tr>
<td>GEOL 422</td>
<td>Seminar II</td>
<td>1</td>
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<tr>
<td>GEOL 487</td>
<td>Research I</td>
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<tr>
<td>GEOL 488</td>
<td>Research II</td>
<td>2</td>
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<tr>
<td>GEOL 494</td>
<td>Senior Thesis</td>
<td>1</td>
</tr>
</tbody>
</table>

28 hours required in other departments:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 150</td>
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<tr>
<td>&amp; 150L</td>
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<tr>
<td>BIOL 151</td>
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<tr>
<td>&amp; 151L</td>
<td>General Biology II Laboratory</td>
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<tr>
<td>BIOL 332</td>
<td>General Ecology</td>
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<td>&amp; 332L</td>
<td>Gen Ecology Lab</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>&amp; 121L</td>
<td>General Chemistry I Laboratory</td>
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<td>CHEM 122</td>
<td>General Chemistry II</td>
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<td>&amp; 122L</td>
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<td>MATH 165</td>
<td>Calculus I</td>
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<td>PHYS 211</td>
<td>College Physics I</td>
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<tr>
<td>&amp; PHYS 211L</td>
<td>and</td>
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</table>

Program Electives

Select four courses from the following list: 12-14

- BIOL 431 Wildlife Management
- BIOL 433 Aquatic Ecology
- CHEM 333 Analytical Chemistry
- GEOE 323 Engineering Geology
- GEOE 417 Hydrogeology
- GEOG 334 Climatology
- GEOG 374 Environmental Remote Sensing & 374L and Environmental Remote Sensing Laboratory
- GEOL 410 Site Characterization
- LAW 263
- PHIL 253 Environmental Ethics
- SPST 430 Earth System Science
- Statistics (PSYC 241, BIOL 470, ECON 210, or MATH 321) 3

Other Approved Electives 24-26

Total Credits 111-115

College of Arts & Sciences

B.A. with Major in Geology

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies requirements (see University ES listing)

II. The following curriculum:

Major hours

- GEOL 101 Introduction to Geology & 101L Introduction to Geology Laboratory 4
- GEOL 102 The Earth Through Time & 102L The Earth Through Time Laboratory 4
- GEOL 256 Critical Thinking in the Geosciences 2
- GEOL 311 Geomorphology 4
- GEOL 318 Mineralogy 3
- GEOL 320 Petrology 3
- GEOL 330 Structural Geology 3
- GEOL 356 Geoscience Lectures 2
- GEOL 420 Geology Capstone 3
- GEOL 422 Seminar II 1

Geology Electives (300 level and above) 13

Required in other departments

- Computer Science and/or Statistics 8
- CHEM 121 General Chemistry I & 121L and General Chemistry I Laboratory 8
- CHEM 122 and General Chemistry II & CHEM 122L and General Chemistry II Laboratory 8
- MATH 103 College Algebra 3
- MATH 105 Trigonometry 2
- PHYS 211 College Physics I & PHYS 211L and 8
- & PHYS 212 and College Physics II 8
- & PHYS 212L and

Select one of the following: 22

- Level IV proficiency in a foreign language and six hours of Social Sciences and Arts and Humanities beyond the University requirement
- Level II proficiency in a foreign language and 14 hours of Social Sciences and Arts and Humanities beyond the University requirement
- Social Sciences and Arts and Humanities beyond the University requirement

Nonspecified electives approved by adviser 7

Total Credits 100

Minor in Geology

Required: 20 credits including:

Select two of the following: 7-8

- GEOL 101 Introduction to Geology & 101L Introduction to Geology Laboratory
- GEOL 102 The Earth Through Time & 102L The Earth Through Time Laboratory
- GEOE 203 Earth Dynamics
- GEOL 103 Introduction to Environmental Issues
- GEOL 111 Views of Earth and Planets
- GEOL 311 Geomorphology
- GEOL 322 Geology, Society, and the Environment

Remaining electives chosen from Geology courses numbered 300 or higher, not including 303 7

Total Credits 20-21
GEOL 101. Introduction to Geology. 3 Credits.
Introduction to the dynamics of the Earth -- volcanoes, earthquakes, plate tectonics, streams, groundwater, glaciers, waves, wind, and landslides, with emphasis on the environmental applications of these processes. Introduction to the tools of the geologist -- minerals, rocks, maps, and aerial photographs. GEOL 101L may be taken concurrently. F.S.S.S.

GEOL 101L. Introduction to Geology Laboratory. 1 Credit.
An introductory laboratory to complement GEOL 101. Field trip(s) included. Prerequisite or Corequisite: GEOL 101. F.S.S.S.

GEOL 102. The Earth Through Time. 3 Credits.
The tracing of changes in the Earth and life through time, with emphasis on the record from North America. GEOL 102L may be taken concurrently. F.S.

GEOL 102L. The Earth Through Time Laboratory. 1 Credit.
An introductory laboratory to complement GEOL 102. Field trip included. Prerequisite or Corequisite: GEOL 102. F.S.

GEOL 103. Introduction to Environmental Issues. 3 Credits.
Introduction to Environmental Issues. A survey of environmental issues concerning society's interaction with Earth's natural systems and exploitation of Earth's resources. F.S.

GEOL 104. Geology of National Parks. 3 Credits.
An overview of the geology of U.S. National Parks. Unifying geological principles are emphasized. Major topics: sandstone parks, volcanic parks, hot springs and geothermal areas, caves and limestone parks, reefs and fossilized reefs, rivers and erosion, ice and glaciers, mountain building and mountain ranges. S.

GEOL 105. Selected Topics. 1-4 Credits.
A special topic course intended for non-geology majors. Subjects will include many issues of interest to non-geologists and non-scientists, such as earthquakes, evolution, gems, and the geology of National Parks. Repeatable when topics vary. Repeatable. On demand.

GEOL 106. Global Warming: The Facts and Myths. 3 Credits.
Global warming is the most debated current challenge to humans. A large, multifaceted and technically challenging topic, it has been diluted to popular slogans that at best capture some aspects of the issue and at the worst are over simplifications. Most of us who are directly affected by global warming do not understand the background, do not know what the assertions are based on, and can not evaluate the correctness of the arguments propagated in mass media such as newspapers and talk-radio. This class will provide students with a clear grasp of the science behind global warming discussion, the typical strategies (pros/cons) that are used in the popular media, and a good understanding of the science-based predictions of upcoming changes in the climate and environment. In addition to providing general scientific background to understand global warming and the science behind it, the class will visit the arguments that are used both for and against global warming. The graded written tests require students to address typical misinformation about global warming, show general knowledge of the scientific background, and recognize typical means to distort science in the mass media.

GEOL 111. Views of Earth and Planets. 3 Credits.
An introduction to Earth and the Solar System. Coverage includes: the planets and their moons, comets, asteroids, impact craters, meteorites, the sun, the solar system's origin, planetary atmospheres, the living Earth, the question of life elsewhere. F.S.

GEOL 111R. Views of the Earth and Planets Recitation. 1 Credit.
A recitation-discussion to complement GEOL 111. Corequisite: GEOL 111. S.

GEOL 203. Earth Dynamics. 3 Credits.
Introductory physical geology course that also includes elements of historical geology, geomorphology, geohazards, and ethics. Intended for engineering and geosciences majors. F.

GEOL 203L. Earth Dynamics Laboratory. 1 Credit.
Laboratory course to accompany Earth Dynamics lecture. The laboratory is delivered as on-campus and virtually using specific required products and digital material. F.

GEOL 205. Surviving on Planet Earth. 3 Credits.
This Essential Studies course stresses critical thinking in covering the basic strategies about humans succeeding on our planet including Earth's hazards (our restless Earth); the balance of life on Earth (evolution and extinction); water in our lives (too much and too little); energy (use and population demands); and global change (Earth as a unique, ongoing experiment). S.

GEOL 220. Computer Applications in Geology and Environmental Science. 2 Credits.
Introduction to the application of computers, software, and digital processing in the geological and environmental sciences. F.

GEOL 256. Critical Thinking in the Geosciences. 2 Credits.
An introduction to the study of geoscience and skills needed to successfully complete a geoscience degree. F.

GEOE 301. Petrophysics. 3 Credits.
Mineral and rock formation, identification and petrophysical properties, particularly with respect to porous rocks and their interactions with fluids. Prerequisite: GEOE 203. Corequisite: GEOE 301L. F.

GEOE 301L. Petrophysics Laboratory. 1 Credit.
Laboratory to accompany GEOE 301. Prerequisite: GEOE 203. Corequisite: GEOE 301. F.

GEOE 302. Reclamation Engineering. 3 Credits.
Principles of reclamation emphasizing: the need for reclamation; geology and hydrogeology of disturbed landscapes, geological, hydrological, and ecological reclamation objectives; current reclamation practices; reclamation of abandoned mine lands; reclamation design; laws, regulations, permits, bonds, and public perception. Includes laboratory and field trip. Prerequisite: GEOL 101 or GEOE 203 or consent of instructor. S.

GEOE 303. Selected Topics in Geology. 1-4 Credits.
Each topic is concerned with a special aspect of geology. May be repeated up to a maximum of 8 hours. Prerequisite: Consent of the instructor. Repeatable to 8 credits. On demand.

GEOL 311. Geomorphology. 4 Credits.
Dynamics of weathering, mass movement, running water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. Prerequisites: GEOL 101 or GEOE 203; MATH 165, PHYS 211, CHEM 121 or consent of instructor. F.

GEOL 318. Mineralogy. 3 Credits.
Survey of the origin, distribution and uses of rock-forming minerals. Introduction to mineral structures, crystal chemistry, and crystallography. Laboratory identification of common minerals in hand sample and petrographic thin section. Introduction to the use of the polarizing microscope. Includes field trip. Prerequisites: GEOL 101 or GEOE 203, and CHEM 121 or consent of instructor. S.

GEOL 320. Petrology. 3 Credits.
Description, classification and origin of igneous, metamorphic, and sedimentary rocks. Field and laboratory study of rocks. Engineering properties of earth materials. Advanced aspects of optical mineralogy. Includes laboratory. Prerequisite: GEOL 318. F.

GEOL 321. Geochemistry. 3 Credits.
Application of the principles of chemistry to geologic and hydrogeologic problems. Origin and distribution of the chemical elements. Introduction to radiochemistry, isotopic geochronology, and stable-isotope geochemistry. Prerequisites: GEOL 318, CHEM 122, and MATH 165 or consent of instructor. S.

GEOL 322. Geology, Society, and the Environment. 3 Credits.
Relationship of geology to society; natural hazards; protection, reclamation, and restoration of our natural environment; application of geology to engineering, land planning, and resource management. Prerequisite: One introductory geology course or upper division standing; MATH 103 is recommended. S, even years.

GEOE 323. Engineering Geology. 3 Credits.
This course is to introduce the application of geological, hydrological and environmental principles to geotechnical/geological engineering design, construction and operation as well as various geohazards. Prerequisites: One introductory geology course and MATH 165. S.

GEOL 330. Structural Geology. 3 Credits.
Mechanics of rock deformation, analysis of rock structures, preparation and interpretation of geologic maps and cross sections showing structural and tectonic features. Includes laboratory. Prerequisites: GEOL 318, GEOL 320 and MATH 105. S.
GEOL 340. Digital Mapping Methods. 3 Credits.
This course integrates "hands-on" data acquisitions and map generation with an overview of the technology (GPS, lasers, and data management). Field projects focus on mapping methodology and laboratory projects focus on analysis and presentation. It is assumed that students have an undergraduate geology background and a basic knowledge of computer applications. Prerequisite: Junior Standing in geology.

GEOL 342. Conservation and Environmental Hydrology. 3 Credits.
Topics relating hydrology to the environment and water conservation, including the global and local hydrological cycle, flood occurrence and prediction, water pollution, erosion and sedimentation, wetlands, and water management. Prerequisites: Introductory geology course or upper division standing; MATH 103. S, odd years.

GEOL 356. Geoscience Lectures. 1 Credit.
Students attend and evaluate departmental lectures given by visiting scientists and engineers, faculty, and students. May be repeated once. May not be taken concurrently with GEOL 422. S/U grading. F,S.

GEOE 397. Cooperative Education. 1-8 Credits.
For qualified students majoring in geological engineering, geology, or environmental geology and technology. A practical work experience with an employer closely associated with the student's academic area. Positions may require student relocation for one or more semesters. Arranged by mutual agreement among student, department, and employer. Special permission required. Repeatable to 24 credits. Repeatable to 24 credits. S/U grading. F,S,SS.

GEOL 407. Petroleum Geology. 3 Credits.
Origin, accumulation and geologic occurrence of petroleum and gas. Prerequisites: GEOL 101 or GEOE 203, and GEOL 102. F. odd years.

GEOL 410. Site Characterization. 3 Credits.
Purposes, techniques, and tools of site investigation. Covers geologic, hyrologic, and ecologic concerns. Hands-on application of principles, tools and techniques at real sites. Prerequisites: GEOL 220, GEOL 311, GEOL 414; BIOL 332, BIOL 333L. F.

GEOL 411. Sedimentology and Stratigraphy. 5 Credits.
Origin, transportation, deposition, and diagenesis of sediments; principles and applications of stratigraphy. Includes field trip and laboratory. Prerequisite: GEOL 320. S.

GEOL 414. Applied Geophysics. 3 Credits.
Principles of various geophysical methods and their application to geologic problems. Prerequisites: GEOL 101 or GEOE 203; MATH 165; and PHYS 211 or 251. F.

GEOL 415. Introduction to Paleontology. 4 Credits.
The principles of paleontology/paleobiology are presented using fossils to document the evolutionary, stratigraphic, and paleoecologic history of animal and plant life on Earth. Includes field trip and laboratory. Prerequisites: GEOL 102; BIOL 150 and BIOL 151 are recommended prerequisites. F, even years.

GEOL 417. Hydrogeology. 3 Credits.
Physical and chemical aspects of groundwater movement, supply, and contamination. Prerequisites: CHEM 121 or CHEM 221; MATH 166 or consent of instructor. F.

GEOL 418. Hydrogeological Methods. 2 Credits.
Field and laboratory methods used in hydrogeology; techniques of drilling, well and piezometer installation, determination of aquifer parameters, geophysical exploration, soil classification and analysis, ground water sampling and analysis. Includes field trip. Prerequisite: GEOE 417. F.

GEOL 419. Groundwater Monitoring and Remediation. 3 Credits.
Statistical methods for groundwater sampling and monitoring network design. Groundwater remediation and design; including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treatment. Prerequisites: MATH 166, GEOE 417 and a statistics course (ECON 210, PSYC 241, MATH 321 or MATH 353) or consent of instructor. S.

GEOL 420. Geology Capstone. 3 Credits.
Geology capstone entails information literacy and communication about Earth materials, processes and history. The course checks retention of earlier learning and insures review and significant addition to that learning. Prerequisite: GEOE 487. Corequisite: GEOE 494. F,S.

GEOL 421. Seminar I. 1 Credit.
Instruction and practice of oral and visual presentation in science and engineering. Includes preparation and delivery of artifact talks, chalk talks, and slide talks. Involves critical review of student presentations and departmental guest lectures. Prerequisite: GEOL 356. F,S.

GEOL 422. Seminar II. 1 Credit.
Continuation of GEOL 421 experience. Preparation and delivery of oral presentations in science and engineering, culminating in oral presentation of senior thesis (Geol 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. Prerequisites: GEOL 421, senior or graduate status in departmental major. F,S.

GEOE 425. Design Hydrology for Wetlands. 3 Credits.
Principles of chemistry, geology, hydrology, and hydrology applied to natural and constructed wetlands and other small catchments. Prerequisites: CHEM 121 and either CE 306/ME 306 or GEOE 417. S.

GEOL 427. Groundwater Modeling. 3 Credits.
Fundamentals of numerical modeling applied to groundwater flow. Spreadsheet calculations will be used to demonstrate the finite difference method applied to groundwater movement and storage. Simulation of practical groundwater problems will be performed using the U.S. Geological Survey's MODFLOW code. Prerequisites: GEOE 417 and MATH 265; some programming experience is recommended. On demand.

GEOE 455. Geomechanics II. 2 Credits.
The objective of this course is to train the students to use fundamental principles and field and lab techniques of Rock Mechanics to analyze real-world problems, identify the optimal methods, and solve the practical geological engineering problems with the combination of field and laboratory, analytical and experimental means. Emphases will be on the fundamental principles and their application to practical engineering problems, both surface and underground. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 355. F.

GEOE 455L. Geomechanics Laboratory. 1 Credit.
Laboratory to accompany GEOE 455. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 455 or consent of instructor. F.

GEOL 484. Geological Engineering Design. 3 Credits.
The first of a two-course sequence in geological engineering design. Define the design problem, establish design objectives, evaluate alternatives, specify constraints, determine a methodology, complete a formal design problem statement. Prerequisites: Advanced level standing in Geological Engineering and consent of advisor. F.

GEOL 485. Geological Engineering Design. 3 Credits.
Continuation of GEOE 484 taken the preceding semester. Systematic study and design, with determination of feasibility, careful assessment of economic factors, safety, reliability, aesthetics, ethics, and social and environmental impact. Results presented in GEOE 422 Seminar. Prerequisite: GEOE 484. Corequisite: GEOE 422. S.

GEOL 487. Research I. 1 Credit.
Identification and proposal of research project. Includes literature review, feasibility review, and formal project identification and written proposal. Selection of faculty research adviser within first month of semester. Prerequisite: Senior standing in departmental major. F,S.

GEOL 488. Research II. 2 Credits.
Execution of research plan developed in GEOL 487. Prerequisite: GEOL 487.

GEOL 491. Geologic Problems. 1-4 Credits.
Individualized or group study on selected geoscience topics. May be taken more than one semester to maximum of 8 hours. Prerequisite: Consent of instructor. Repeatable to 8 credits. F,S,SS.

GEOE 493. Selected Topics in Geological Engineering. 1-3 Credits.
Detailed study of selected topics in Geological Engineering. Includes laboratory if applicable. Repeatable. Repeatable. On demand.

GEOL 494. Senior Thesis. 1 Credit.
Written results of research conducted in Geol 489. The thesis document should conform to the format guidelines of a major English-language journal in which the thesis could be published. A copy is to be provided to the F.D. Holland, Jr. Geology Library. Prerequisite or Corequisite: GEOE 488. F,S.
GEOE Courses

GEOE 203. Earth Dynamics. 3 Credits.
Introductory physical geology course that also includes elements of historical geology, geomorphology, geohazards, and ethics. Intended for engineering and geosciences majors. F.

GEOE 203L. Earth Dynamics Laboratory. 1 Credit.
Laboratory course to accompany Earth Dynamics lecture. The laboratory is delivered as on-campus and virtually using specific required products and digital material. F.

GEOE 210. Earth Dynamics & Geophysics. 4 Credits.
Introduction to geology with an emphasis on those aspects of the science that are essential for petroleum engineers. Topics covered include an introduction to geologic features and processes that are responsible for accumulations of petroleum products in the subsurface. F.

GEOE 301. Petrophysics. 3 Credits.
Mineral and rock formation, identification and petrophysical properties, particularly with respect to porous rocks and their interactions with fluids. Prerequisite: GEOE 203. Corequisite: GEOE 301L. F.

GEOE 301L. Petrophysics Laboratory. 1 Credit.
Laboratory to accompany GEOE 301. Prerequisite: GEOE 203. Corequisite: GEOE 301. F.

GEOE 302. Reclamation Engineering. 3 Credits.
Principles of reclamation emphasizing: the need for reclamation; geology and hydrogeology of disturbed landscapes, geological, hydrological, and ecological reclamation objectives; current reclamation practices; reclamation of abandoned mine lands; reclamation design; laws, regulations, permits, bonds, and public perception. Includes laboratory and field trip. Prerequisite: GEOE 101 or GEOE 203 or consent of instructor. S.

GEOE 323. Engineering Geology. 3 Credits.
This course is to introduce the application of geological, hydrological, and environmental principles to geotechnical/geological engineering design, construction and operation as well as various geohazards. Prerequisites: One introductory geology course and MATH 165. S.

GEOE 351. Petroleum Development Engr. 3 Credits.
To introduce the student to the fundamental knowledge of geomatics and mechanical behavior of geomatics; to familiarize the student with the use of soil mechanics; to provide the student with a firm foundation for the continuation to more theoretical and applied aspects in pavement engineering, foundation engineering, dam engineering, geological engineering, and earthquake engineering. Prerequisite: ENGR 203. S.

GEOE 359. Cooperative Education. 1-8 Credits.
For qualified students majoring in geological engineering, geology, or environmental geology and technology. A practical work experience with an employer closely associated with the student’s academic area. Positions may require student relocation for one or more semesters. Arranged by mutual agreement among student, department, and employer. Special permission required. Repeatable to 24 credits. Repeatable to 24 credits. S/U grading. F,S,SS.

GEOE 417. Hydrogeology. 3 Credits.
Physical and chemical aspects of groundwater movement, supply, and contamination. Prerequisites: CHEM 121 or CHEM 221; MATH 166 or consent of instructor. F.

GEOE 418. Hydrogeological Methods. 2 Credits.
Field and laboratory methods used in hydrogeology; techniques of drilling, well and piezometer installation, determination of aquifer parameters, geophysical exploration, soil classification and analysis, ground water sampling and analysis. Includes field trip. Prerequisite: GEOE 417. F.

GEOE 419. Groundwater Monitoring and Remediation. 3 Credits.
Statistical methods for groundwater sampling and monitoring network design. Groundwater remediation and design; including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treatment. Prerequisites: MATH 166, GEOE 417 and a statistics course (ECON 210, PSYC 241, MATH 321 or MATH 353) or consent of instructor. S.

GEOE 425. Design Hydrology for Wetlands. 3 Credits.
Principles of chemistry, geology, hydrology, and hydrology applied to natural and constructed wetlands and other small catchments. Prerequisites: CHEM 121 and either CE 306/ME 306 or GEOE 417. S.

GEOE 427. Groundwater Modeling. 3 Credits.
Fundamentals of numerical modeling applied to groundwater flow. Spreadsheet calculations will be used to demonstrate the finite difference method applied to groundwater movement and storage. Simulation of practical groundwater problems will be performed with the U.S. Geological Survey's MODFLOW code. Prerequisites: GEOE 417 and MATH 265; some programming experience is recommended. On demand.

GEOE 455. Geomaterials II. 2 Credits.
The objective of this course is to train the students to use fundamental principles and field and lab techniques of Rock Mechanics to analyze real-world problems, identify the optimal methods, and solve the practical geological engineering problems with the combination of field and laboratory, analytical and experimental means. Emphases will be on the fundamental principles and their application to practical engineering problems, both surface and underground. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 355. F.

GEOE 455L. Geomaterials Laboratory. 1 Credit.
Laboratory to accompany GEOE 455. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 455 or consent of instructor. F.

GEOE 456. Geomaterials Stabilization. 3 Credits.
The course is to highlight the need for geomaterial improvement and stabilization in engineering. To provide an understanding for the different principles, analysis, design procedures and applications for geomaterial stabilization and ground improvement. Prerequisite: GEOE 355 or equivalent course with instructor’s consent. F.

GEOE 484. Geological Engineering Design. 3 Credits.
The first of a two-course sequence in geological engineering design. Define the design problem, establish design objectives, evaluate alternatives, specify constraints, determine a methodology, complete a formal design problem statement. Prerequisites: Advanced level standing in Geological Engineering and consent of advisor. F.

GEOE 485. Geological Engineering Design. 3 Credits.
Continuation of GEOE 484 taken the preceding semester. Systematic study and design, with determination of feasibility, careful assessment of economic factors, safety, reliability, aesthetics, ethics, and social and environmental impact. Results presented in GEOE 422 Seminar. Prerequisite: GEOE 484. Corequisite: GEOE 422. S.

GEOE 493. Selected Topics in Geological Engineering. 1-3 Credits.
Detailed study of selected topics in Geological Engineering. Includes laboratory if applicable. Repeatable. Repeatable. On demand.

GEOL Courses

GEOL 101. Introduction to Geology. 3 Credits.
Introduction to the dynamics of the Earth -- volcanoes, earthquakes, plate tectonics, streams, groundwater, glaciers, waves, wind, and landslides, with emphasis on the environmental applications of these processes. Introduction to the tools of the geologist -- minerals, rocks, maps, and aerial photographs. GEOL 101L may be taken concurrently. F,S,SS.

GEOL 101L. Introduction to Geology Laboratory. 1 Credit.
An introductory laboratory to complement GEOL 101. Field trip(s) included. Prerequisite or Corequisite: GEOL 101. F,S,SS.

GEOL 102. The Earth Through Time. 3 Credits.
The tracing of changes in the Earth and life through time, with emphasis on the record from North America. GEOL 102L may be taken concurrently. F,S.

GEOL 102L. The Earth Through Time Laboratory. 1 Credit.
An introductory laboratory to complement GEOL 102. Field trip included. Prerequisite or Corequisite: GEOL 102. F,S.

GEOL 103. Introduction to Environmental Issues. 3 Credits.
Introduction to Environmental Issues. A survey of environmental issues concerning society’s interaction with Earth’s natural systems and exploitation of Earth’s resources. F,S.

GEOL 104. Geology of National Parks. 3 Credits.
An overview of the geology of U.S. National Parks. Unifying geological principles are emphasized. Major topics: sandstone parks, volcanic parks, hot springs and geothermal areas, caves and limestone parks, reefs and fossilized reefs, rivers and erosion, ice and glaciers, mountain building and mountain ranges. S.
GEOL 105. Selected Topics. 1-4 Credits.
A special topic course intended for non-geology majors. Subjects will include many issues of interest to non-geologists and non-scientists, such as earthquakes, evolution, gems, and the geology of National Parks. Repeatable when topics vary. Repeatable. On demand.

GEOL 106. Global Warming: The Facts and Myths. 3 Credits.
Global warming is the most debated current challenge to humans. A large, multifaceted and technically challenging topic, it has been diluted to popular slogans that at best capture some aspects of the issue and at the worst are over simplifications. Most of us who are directly affected by global warming do not understand the background, do not know what the assertions are based on, and can not evaluate the correctness of the arguments propagated in mass media such as newspapers and talk-radio. This class will provide students with a clear grasp of the science behind global warming discussion, the typical strategies (pros/cons) that are used in the popular media, and a good understanding of the science-based predictions of upcoming changes in the climate and environment. In addition to providing general scientific background to understand global warming and the science behind it, the class will visit the arguments that are used both for and against global warming. The graded written tests require students to address typical misinformation about global warming, show general knowledge of the scientific background, and recognize typical means to distort science in the mass media.

GEOL 111. Views of Earth and Planets. 3 Credits.
An introduction to Earth and the Solar System. Coverage includes: the planets and their moons, comets, asteroids, impact craters, meteors, the sun, the solar system's origin, planetary atmospheres, the living Earth, the question of life elsewhere. F.S.

GEOL 111R. Views of the Earth and Planets Recitation. 1 Credit.
A recitation-discussion to complement GEOL 111. Corequisite: GEOL 111. S.

GEOL 205. Surviving on Planet Earth. 3 Credits.
This Essential Studies course stresses critical thinking in covering the basic strategies about humans succeeding on our planet including Earth's hazards (our restless Earth); the balance of life on Earth (evolution and extinction); water in our lives (too much and too little); energy (use and population demands); and global change (Earth as a unique, ongoing experiment). S.

GEOL 220. Computer Applications in Geology and Environmental Science. 2 Credits.
Introduction to the application of computers, software, and digital processing in the geological and environmental sciences. F.

GEOL 256. Critical Thinking in the Geosciences. 2 Credits.
An introduction to the concept of geoscience and skills needed to successfully complete a geoscience degree. F.

GEOL 303. Selected Topics in Geology. 1-4 Credits.
Each topic is concerned with a special aspect of geology. May be repeated up to a maximum of 8 hours. Prerequisite: Consent of the Instructor. Repeatable to 8 credits. On demand.

GEOL 311. Geomorphology. 4 Credits.
Dynamics of weathering, mass movement, running water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. Prerequisites: GEOL 101 or GEOE 203; MATH 165, PHYS 211, CHEM 121 or consent of instructor. F.

GEOL 316. Earth Materials. 4 Credits.
We will organize the course into three Parts: Part I will provide the context in which Earth materials are studied, fundamental concepts that will be used subsequently including: how we study Earth materials, how Earth materials interact with other components of the Earth system, and a rationale for why Earth materials are important for the study of Earth (including processes and history) and the importance of Earth materials in our personal and societal lives. Part II will undertake a systematic look at Earth materials as they occur in different settings. We will identify and describe the key Earth materials, their properties, their distribution and occurrences, the processes that form them, and how scientists use these materials to interpret Earth. Part III will be an investigation of the practical applications of Earth materials to issues of societal importance (e.g., resources, hazards, engineering) and special applications that affect contemporary issues related to living on Earth. This course has both a lecture and a laboratory component. Prerequisites: GEOL 101, GEOL 101L, and CHEM 121 or equivalent. S.

GEOL 318. Mineralogy. 3 Credits.
Survey of the origin, distribution and uses of rock-forming minerals. Introduction to mineral structures, crystal chemistry, and crystallography. Laboratory identification of common minerals in hand sample and petrographic thin section. Introduction to the use of the polarizing microscope. Includes field trip. Prerequisites: GEOL 101 or GEOE 203, and CHEM 121 or consent of instructor. S.

GEOL 320. Petrology. 3 Credits.
Description, classification and origin of igneous, metamorphic, and sedimentary rocks. Field and laboratory study of rocks. Engineering properties of earth materials. Advanced aspects of optical mineralogy. Includes laboratory. Prerequisite: GEOL 318. F.

GEOL 321. Geochemistry. 3 Credits.
Application of the principles of chemistry to geologic and hydrogeologic problems. Origin and distribution of the chemical elements. Introduction to radiochemistry, isotopic geochronology, and stable-isotope geochemistry. Prerequisites: GEOL 318, CHEM 122, and MATH 165 or consent of instructor. S.

GEOL 322. Geology, Society, and the Environment. 3 Credits.
Relationship of geology to society; natural hazards; protection, reclamation, and restoration of our natural environment; application of geology to engineering, land planning, and resource management. Prerequisite: One introductory geology course or upper division standing; MATH 103 is recommended. S, even years.

GEOL 330. Structural Geology. 3 Credits.
Mechanics of rock deformation, analysis of rock structures, preparation and interpretation of geologic maps and cross sections showing structural and tectonic features. Includes laboratory. Prerequisites: GEOL 318, GEOL 320 and MATH 105. S.

GEOL 340. Digital Mapping Methods. 3 Credits.
This course integrates "hands-on" data acquisitions and map generation with an overview of the technology (GPS, lasers, and data management). Field projects focus on mapping methodology and laboratory projects focus on analysis and presentation. It is assumed that students have an undergraduate geology background and a basic knowledge of computer applications. Prerequisite: Junior Standing in geology.

GEOL 342. Conservation and Environmental Hydrology. 3 Credits.
Topics relating hydrology to the environment and water conservation, including the global and local hydrological cycle, flood occurrence and prediction, water pollution, erosion and sedimentation, wetlands, and water management. Prerequisites: Introductory geology course or upper division standing; MATH 103. S, odd years.

GEOL 356. Geoscience Lectures. 1 Credit.
Students attend and evaluate departmental lectures given by visiting scientists and engineers, faculty, and students. May be repeated once. May not be taken concurrently with GEOL 422. S/U grading. F.S.

GEOL 407. Petroleum Geology. 3 Credits.
Origin, accumulation and geologic occurrence of petroleum and gas. Prerequisites: GEOL 101 or GEOE 203, and GEOL 102. F. odd years.

GEOL 410. Site Characterization. 3 Credits.
Purposes, techniques, and tools of site investigation. Covers geologic, hydrologic, and ecologic concerns. Hands-on application of principles, tools and techniques at real sites. Prerequisites: GEOL 220, GEOL 311, GEOL 414; BIOL 332, BIOL 332L. F.

GEOL 411. Sedimentology and Stratigraphy. 5 Credits.
Origin, transportation, deposition, and diagenesis of sediments; principles and applications of stratigraphy. Includes field trip and laboratory. Prerequisite: GEOL 320. S.

GEOL 414. Applied Geophysics. 3 Credits.
Principles of various geophysical methods and their application to geologic problems. Prerequisites: GEOL 101 or GEOE 203; MATH 165; and PHYS 211 or 251. F.

GEOL 415. Introduction to Paleontology. 4 Credits.
The principles of paleontology/paleobiology are presented using fossils to document the evolutionary, stratigraphic, and paleoecologic history of animal and plant life on Earth. Includes field trip and laboratory. Prerequisites: GEOL 102; BIOL 150 and BIOL 151 are recommended prerequisites. F, even years.
GEOl 420. Geology Capstone. 3 Credits.
Geology capstone entailing information literacy and communication about Earth materials, processes and history. The course checks retention of earlier learning and insures review and significant addition to that learning. Prerequisite: GEOl 487. Corequisite: GEOl 494. F.S.

GEOl 421. Seminar I. 1 Credit.
Instruction and practice of oral and visual presentation in science and engineering. Includes preparation and delivery of artifact talks, chalk talks, and slide talks. Involves critical review of student presentations and departmental guest lectures. Prerequisite: GEOl 356. F.S.

GEOl 422. Seminar II. 1 Credit.
Continuation of GEOl 421 experience. Preparation and delivery of oral presentations in science and engineering, culminating in oral presentation of senior thesis (GEOl 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. Prerequisites: GEOl 421, senior or graduate status in departmental major. F.S.

GEOl 487. Research I. 1 Credit.
Identification and proposal of research project. Includes literature review, feasibility review, and formal project identification and written proposal. Selection of faculty research adviser within first month of semester. Prerequisite: Senior standing in departmental major. F.S.

GEOl 488. Research II. 2 Credits.
Execution of research plan developed in GEOl 487. Prerequisite: GEOl 487.

GEOl 491. Geologic Problems. 1-4 Credits.
Individualized or group study on selected geoscience topics. May be taken more than one semester to maximum of 8 hours. Prerequisite: Consent of instructor. Repeatable to 8 credits. F.S.SS.

GEOl 494. Senior Thesis. 1 Credit.
Written results of research conducted in GEOl 489. The thesis document should conform to the format guidelines of a major English-language journal in which the thesis could be published. A copy is to be provided to the F.D. Holland, Jr. Geology Library. Prerequisite or Corequisite: GEOl 488. F.S.

History (Hist)

http://www.arts-sciences.und.edu/history

Berger, Broedel, Berg-Burin, Burin, Campbell, Caraher, Iseminger, Kelsch, Mochoruk, Porter, Prescott and Reese (Chair)

The History program at the University prepares students to understand themselves and their society, as well as people in different cultures in the past and in the present. The study of History requires that students refine their informational literacy, critical thinking and written communication skills as all are vital to the study and understanding of the past. Beyond this, the department prepares students for the teaching of history at all levels, public history work, government service, and graduate studies in history and more broadly the skills that History provides are attractive to a variety of employers. The study of history may also serve as pre-professional preparation for other areas such as law or the ministry.

Two options are offered for the History major, and each by itself leads to a B.A. with a major in History. Option A is primarily for those who plan to enter professional schools, such as law, and for those who want to pursue advanced work in history at the graduate level. Option B is designed primarily for those who want to enter public history professions, government service, business, or teaching at the secondary level.

Prospective teachers should seek an adviser in the College of Education and Human Development in addition to their adviser in the History department.

College of Arts and Sciences

B.A. with Major in History

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies (see University ES listing).

II. One of the following curriculum options:

Option A

39 major hours, including:

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<tr>
<td>9</td>
<td>credits from HIST 101, HIST 102, HIST 103, HIST 104, HIST 105, HIST 106</td>
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<td>3</td>
<td>HIST 240 The Historian’s Craft</td>
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<td>3</td>
<td>HIST 347 Seminar</td>
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<td>3</td>
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<td>6 Credits from North American History Selection</td>
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<td>3</td>
<td>3 Credits from World History Selection</td>
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<td>6</td>
<td>6 Credits from the above three categories</td>
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Required in other departments:

- A minor, second major, or teaching certification

Total Credits 39

Option B

39 Major hours, including:

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<tr>
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Required in other departments:

- A minor, second major, or teaching certification

Total Credits 39

Minor in History

21 credits required:

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<tr>
<td>3</td>
<td>HIST 240 The Historian’s Craft</td>
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<tr>
<td>9</td>
<td>No more than 9 credits of 100 and/or 200 level classes</td>
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<tr>
<td>9</td>
<td>At least 9 credits of 300 and/or 400 level classes</td>
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Total Credits 21

Related Field Concentration in Intellectual History, Minor Only

Required: 20 credits Upper Level work approved by the chairs of the History or Philosophy Departments.

Such courses as follows may be used:

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<tr>
<th>Hours</th>
<th>Description</th>
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<tbody>
<tr>
<td>3</td>
<td>HIST 330 The United States: Social and Cultural, 19th Century</td>
</tr>
<tr>
<td>3</td>
<td>PHIL 300 Ancient Philosophy</td>
</tr>
<tr>
<td>3</td>
<td>PHIL 301 Medieval Philosophy</td>
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<td>3</td>
<td>PHIL 302 Renaissance and Enlightenment</td>
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<td>3</td>
<td>PHIL 303 Kant and the Nineteenth Century</td>
</tr>
<tr>
<td>3</td>
<td>PHIL 312 American Philosophy</td>
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<tr>
<td>6</td>
<td>ART 210 History of Art I</td>
</tr>
<tr>
<td>3</td>
<td>ART 410 History of Art: Selected Topics</td>
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</tbody>
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Courses

HIST 101. Western Civilization I. 3 Credits.
An interpretive survey of Western Civilization from earliest times to the close of the European Middle Ages. F.S.
HIST 102. Western Civilization II. 3 Credits.
A comprehensive survey of Western Civilization from the Reformation to the present, with emphasis on movements and institutions common to Western Europe and their influence on the rest of the world. F.S.

HIST 103. United States to 1877. 3 Credits.
A survey of early American history, including old world background, transformation of British institutions into American institutions, revolution, and the establishment of the Union with its temporary breakup in Civil War. F.S.

HIST 104. United States since 1877. 3 Credits.
A survey of the history of the United States since Reconstruction, including the transformation of an isolationist, agrarian nation into an urban industrial and world power with attention to the resulting domestic social, economic and political changes. F.S.

HIST 105. World Civilizations I. 3 Credits.
Thematic comparative survey of world history from the earliest times to the middle ages, focusing on cultural difference, interaction and exchange. Major course themes will include the origin of urban civilizations, the growth of empires, the effects of environmental change, and the development of major religions, technologies, and scientific knowledge. F.S.

HIST 106. World Civilizations II. 3 Credits.
This course surveys major world history stories and themes beginning around the second millennium CE: the growing interaction between peoples from 1000-3000, the spread of major religions, different forms of scientific knowledge, the role of disease in history, the rise of nation-states, empires, and world war. F.S.

HIST 204. Canada to 1867. 3 Credits.
A survey of pre-Confederation Canadian history from the pre-Columbian period to 1867. Particular attention will be paid to the social, economic, and political factors in Europe and North America which shaped Canada’s colonial history occurring since the Civil War. F, odd years.

HIST 205. Canada since 1867. 3 Credits.
A survey of Canadian history from Confederation to the present. Beginning with an overview of pre-Confederation Canada, this course will focus upon the cultural, economic, and political factors that have shaped Canada in the modern era. S, even years.

HIST 210. United States Military History. 3 Credits.
A survey from colonial times to the present of the Army’s role in the formulation and implementation of national defense. Attention is given to the Constitutional and legal status of the Army, changing concepts in military organization and training, public attitudes toward the military, and the influence of the Army on American society. Specific wars and battles are studied in terms of military tactics and strategy. F.

HIST 220. History of North Dakota. 3 Credits.
A survey emphasizing settlement and development, noting the consequences of the state’s location, climate, and settlers on the situation in which it now finds itself. Special attention is paid to the Nonpartisan League story and the evolution of isolationist sentiment among North Dakotans. Recommended for Social Science major certification. F.S.

HIST 230. A Cultural History of Science and Technology. 3 Credits.
Introduction to the history of science and technology from antiquity to the present. The course investigates how societies have described the natural world and developed the tools needed to manipulate it for their benefit. Course focuses on relationships between cultures, their sciences, and their technologies, while looking particularly at global pre-modern societies, the European scientific and industrial revolutions, and the social and cultural effects of the development of modern science and technology. S, even years.

HIST 240. The Historian’s Craft. 3 Credits.
An introduction to research and writing history. Students will learn critical reading of secondary sources, how to locate and evaluate resources, how to analyze evidence, how to apply the style and form of historical writing, and how to utilize methods of research. Students will also study historiography and types of historical writing and practice. F.S.

HIST 250. The Civil Rights Movement. 3 Credits.
This course examines the “long” Civil Rights Movement, surveying not only the well-known struggles of the 1954-1965 period, but also significant episodes that came before and after that famous era. Along the way, the class explores contemporaries’ accounts of the movement, how the crusade has been portrayed over the years, how Americans remember the saga nowadays, and civil rights today. S, odd years.

HIST 260. Slaves, Citizens and Social Change. 3 Credits.
Through intense role playing and a highly interactive learning environment, students in this course explore key historic debates in American history about slavery, capitalism, citizenship, and women’s roles. Class sessions are student-centered and directed, while professors advise, guide and evaluate oral and written work. On demand.

HIST 269. World War II. 3 Credits.
A brief survey of the background, strategy and major campaigns of World War II including some of the diplomatic and political problems encountered by the major belligerents. The course includes extensive use of documentary film. S, odd years.

HIST 300. Topics in History. 1 Credit.
Topics in history which allow the student to study a specialized subject. 4 credits may apply to the history minor; 6 credits to the history major. Repeatable to 6 credits. Repeatable to 6 credits. F.S.

HIST 301. Medieval Civilization. 3 Credits.
A survey of the development of Europe from the late Roman Empire to the Renaissance. Emphasis is on political and intellectual developments. S, odd years.

HIST 325. American West. 3 Credits.
Explores the lives of diverse peoples living in western North America from the 16th century to the present. Topics include migrations, intercultural interactions, environmental change, and the West in popular culture. On demand.

HIST 327. France and Empire. 3 Credits.
This course will explore the development of modern French history from 1789-present. French history is highly contentious, characterized by revolution, imperialism, and a variety of marginalized groups fighting for rights as full citizens. The course is organized chronologically and themes will include politics, empire, society, and culture. F, odd years.

HIST 328. Historical Perspectives on Europe and Human Rights. 3 Credits.
This course will study how the concept of human rights developed in Europe from the 18th through the 20th centuries. Thematically oriented, topics will include changing conceptions of punishment and torture, women’s rights as human rights, critiques of the viability of human rights as a concept, and the processes of inclusion and exclusion in terms of who is entitled to rights. S, odd years.

HIST 330. The United States: Social and Cultural, 19th Century. 3 Credits.
A survey of the contributions of social institutions (such as the family, school, and church) to the development of a national culture. The colonial background is considered briefly, but emphasis is given to the first half of the nineteenth century. Changing attitudes toward social reform, intellectualism, class status, and minorities (such as children, women, blacks, and Indians) are examined. Competing regional trends in economics, social, political, and intellectual attitudes and institutions provide the dynamics for understanding the failure of nationalism during the antebellum period. On demand.

HIST 332. Women in Early America. 3 Credits.
How did women experience and shape American history and the United States as we know it today? This course explores the social, political, and economic lives of women from diverse cultural backgrounds in colonial America and the early United States. Using gender, race, class, and culture as analytical lenses reveals the struggles and victories of women, as well as their individual and collective influence on the broader society. F, odd years.

HIST 333. Women in Modern America. 3 Credits.
How did women experience and shape American history and the United States as we know it today? This course explores the social, political, and economic lives of American women from diverse cultural backgrounds from the rise of the "New Woman" in the late 19th century to the present. Using gender, race, class, and culture as analytical lenses reveals the struggles and victories of women, as well as their individual and collective influence on the broader society. S, even years.

HIST 335. Nuclear Weapons and the Modern Age. 3 Credits.
An introduction to the history of: nuclear weapons and their delivery systems, their development and use during World War II, the nuclear arms race between the U.S. and the U.S.S.R., popular disarmament movements, and diplomatic efforts to control nuclear weapons and their proliferation. A final section will deal with the nuclear implications of the end of the Cold War and the development of new nuclear states in the last years of the 20th century. The course will include--from an historian’s point of view--some technical material necessary to a reasonable and realistic understanding of the subject. S, even years.
HIST 338. The United States and Vietnam, 1945-1975. 3 Credits.
An exploration of Southeast Asian as well as American history. This course will survey briefly the development of Vietnamese culture and nationalism, the history of French imperialism in Indochina as background to an examination of the development of the Vietnamese independence movement, the origins of Vietnamese communism, the war for independence from France, and the violent and tragic relationship between the U.S. and Vietnam from the end of World War II to the final departure of American forces from Saigon. S, even years.

HIST 343. Ancient Greece. 3 Credits.
A study of Greek prehistory and history to the end of the Hellenistic era. Greek achievements in art, commerce, literature, politics, religion, science, and technology are surveyed. F, odd years.

HIST 344. Ancient Rome. 3 Credits.
A survey of the prehistory, historical development, and ultimate decline in Rome. In addition to inquiries into the military, political, cultural, economic, and religious experiences of the ancient Romans, this course will attempt to delineate those qualities of life that were peculiarly Roman. S, even years.

HIST 345. The Ancient Near East. 3 Credits.
A course intended to acquaint the student with cultures of the ancient western Asian world. Egypt, Iran, Iraq, Turkey, and the Levant are the areas emphasized. S, even years.

HIST 365. Europe since 1918. 3 Credits.
The flow of events and ideas in Europe from the beginning of the Reformation to the end of the religious wars. F, even years.

HIST 370. African-American History to 1877. 3 Credits.
The course concludes with an examination of when and why the idea of race first developed; it then surveys colonial slavery, the impact of the American Revolution on race relations, and the slave community during the antebellum period. We also consider the lives of free blacks in the North and South, as well as the similarities and differences between U.S. and Latin American slavery. The course concludes with a detailed look at Reconstruction, this nation's experiment in interracial democracy. Through lecture, discussion, projects, and writing assignments, History 370 highlights both the tribulations and triumphs of African Americans. F.

HIST 371. African-American History since 1877. 3 Credits.
This course begins with a brief overview of Reconstruction; it then examines Populism, the entrenchment of Jim Crow segregation, and the philosophies of Booker T. Washington and W.E.B. DuBois. We also explore the impact of World War I on African Americans, as well as the Great Migration, the Harlem Renaissance, and the Great Depression/World War II era. Several weeks are devoted to the Civil Rights and Black Power Movements, and the course concludes with an examination of contemporary race relations. A mixture of lectures, discussion, projects, and writing assignments, History 371 emphasizes both the trials and triumphs of African Americans since 1877, and endeavors to discover (and cultivate) the forces which promote racial equality and social justice. S.

HIST 381. Modern Africa. 3 Credits.
This course will survey Africa's history from the earliest times to the present. The majority of the class will focus upon the period from 1500 to the present and will explore how both internal and external forces shaped Africa's history, especially in the 19th and 20th centuries. The class will spend time discussing the current problems and opportunities of Africa to present the students with a broad understanding of globalization. S, even years.
HIST 408. The United States, 1920-1945. 3 Credits.
A study of American society from the end of World War I through World War II. Emphasis will be placed upon the Republican ascendency and social changes during the 1920s, the causes of the Great Depression, the New Deal, the road to World War II, and the war, especially the homefront. F, odd years.

HIST 412. U.S. Foreign Relations since 1900. 3 Credits.
An advanced survey of the major policies advocated and pursued by the U.S. during the 20th century. S, odd years.

HIST 413. The United States since 1945. 3 Credits.
An advanced examination of the United States as it has developed from the height of its power, influence, and prosperity through years of upheaval, cultural and political transformation, and economic decline. F, even years.

HIST 419. Great Britain since 1815. 3 Credits.
A survey of British history since 1815 with an emphasis on the state of mind known as “Victorian,” as it was manifested, practiced, or criticized in the nineteenth century; its influence on economics, politics, foreign affairs, and social policy; and its vestiges in modern-day Britain. F, even years.

HIST 421. The British Empire, 1496-1884. 3 Credits.
A survey of British Imperial history from the Tudors to the “Scramble for Africa.” Particular attention will be paid to the social, economic, and political factors which shaped Britain’s Imperial history as well as the history of its colonies. F, odd years.

HIST 422. The British Empire and Commonwealth, 1884-the Present. 3 Credits.
A survey of British Imperial history from the “Scramble for Africa” to the present. Beginning with an overview of the early Empire, this course will focus upon the cultural, economic, and political factors which shaped and led to the reconstruction of the Empire/Commonwealth in the modern era. S, even years.

HIST 423. Historical Perspectives on the Holocaust, 1919-1945. 3 Credits.
This course is devoted to exploring the Holocaust from a historical perspective. This includes examining the events leading up to it, the horror destruction that took place from 1939-1945, and how the Holocaust is remembered by Americans. World War II devastated European society and most Jewish communities were virtually destroyed. Those deemed “handicapped” by Nazis were slated for death, as were Roma and Sinti populations. Political opponents and homosexuals were severely persecuted and killed. This class will explore the extremely complex questions of how and why this happened. In addition, we will examine how history is written. The study of history involves active Interpretation and critical thought, and to this end, we will evaluate the arguments of several historians to help us answer the questions framing this class. Students should expect a discussion oriented class centered around assigned daily readings. Lectures, videos, and discussion of current events will supplement the readings-based discussion. S.

HIST 424. European Witch Trials. 3 Credits.
An examination of the development and content of European witch-beliefs and persecution, from their origins in antiquity and the middle ages through the dawn of the modern era. Emphasis upon witchcraft as a social, legal, and cultural phenomenon. S, odd years.

HIST 425. American Family in Historical Perspective. 3 Credits.
This course is devised as a survey of the family over the nation’s first 400 years of existence. Course members will examine variations in the structure of the family, changes in the definition of the family and the forces which have wrought significant alterations in this most basic of social institutions, taking into consideration race, culture, and gender. S.

HIST 426. Revolutions in Modern Europe. 3 Credits.
This course will take a social history approach to explore what constitutes a “revolution.” We will focus on the non-elites who played key roles revolutionizing European societies inside and outside of Europe’s borders by examining the actions of non-elites, including women, ethno-religious minorities, colonial peoples, and the lower class. In doing so, we will stretch the boundaries of traditional conceptions of “the revolution” by incorporating a global view of how to understand revolutionary social change in Europe. F, even years.

HIST 431. Seminar in the History of the Great Plains. 3 Credits.
This course promotes focused study of the Great Plains of North America through reading, discussion, research, and writing. Students will examine all aspects of Great Plains history including culture, environment, social organization, economics, and politics from the ancient past to the present. S, odd years.

HIST 440. Research Capstone. 3 Credits.
In this capstone experience, students work closely with a member of the faculty to design and conduct a major research project on a topic of their choice. Students refine their skills in critical thinking, archival research, and persuasive written and oral communication. Prerequisite: HIST 347. F.S.

HIST 450. European Social History. 3 Credits.
This course will cover the methods, historiography, and problems of European social history. The course is divided into three sections for topical content: the Ancien Regime, the Age of Reform, and the Twentieth Century. There are several fairly specific skills students will develop, all of which can loosely be organized under the general heading of “how historians think,” to be able to distinguish between a primary and a secondary source; to be able to analyze a primary source within its appropriate historical context; to be able to locate the thesis or argument in a secondary source and to be able to offer an informed evaluation of that argument; to be able to read a secondary source within its particular context as part of a larger discussion of facts, individuals, events, etc.; and to be able to construct a sound historical thesis/argument of their own, whether in writing or class discussions. F, even years.

HIST 460. The Atlantic World. 3 Credits.
This is a comparative world history course that focuses upon the cultural, economic, social, political, ideological and religious interaction, competition, conflict and change between Western Europe, West Africa, and the Americas. The course will begin in the 1400s by examining the foundations of European expansion and end with the revolutions of the Americas and Europe in the late 18th and early 19th centuries. A major focus of the class will be cultural interaction, the slave trade, and the foundations of the modern world system. F, odd years.

HIST 470. United States-Canadian Relations, 1776 to the Present. 3 Credits.
This course explores the historical relationships linking and dividing Canada and the United States of America since 1774. Because of the unique constitutional and diplomatic status of British North America and then Canada itself, this course examines the often complex tri-partite relationship between the U.S., Canada, and Great Britain. F, even years.

HIST 480. Introduction to Public History. 3 Credits.
An introduction to public history at federal, state, and local levels. Emphasis is given to archival theory, oral history, museum studies and historic preservation, with attention to awareness of historical resources. On demand.

HIST 481. Public History Practice. 3 Credits.
A practicum in which the student learns through experience the techniques of public history work. S, odd years.

HIST 489. Senior Honors Thesis. 1-15 Credits.
A practicum in which the student learns through experience the techniques of public history work. S, odd years.

Histotechnician Certificate Program

http://www.med.und.edu/histotechnology/

Hoffman, Lunak, Paur (Chair, Program Director)

The Histotechnician Certificate Program at the University of North Dakota is within the Department of Medical Laboratory Science. It is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), at 5600 N. River Road, Suite 720, Rosemont, IL 60018, 773-714-8880.

Histotechnicians prepare specimens for research or medical diagnosis by a pathologist. They work to process tissues that have been removed during surgery. Fine motor skills are used to cut the tissue into very thin slices which are mounted on slides and stained with special dyes to make cellular detail visible under the microscope. Microscopic examination of these tissue sections allows for the detection of disease processes and aids in deciding the course of treatment for the patient.

Histotechnicians must work quickly, as they are frequently under pressure to deliver results while the patient is in surgery. They work with fragile, delicate...
instruments, knives, chemicals and glass slides. He or she must value precision and be comfortable working with equipment that requires careful monitoring.

Histotechnology professionals work in hospitals, for-profit laboratories, clinics, public health facilities, and industry. Additional opportunities are available in industrial research, veterinary pathology, marine biology and forensic pathology. (From "A Career as a Histotechnologist and Histotechnician," American Society for Clinical Pathology.)

The UND admission and advance placement policies, as well as the policies for special examination/validation for credit, are included in the Academic Catalog or on the UND website at: www.und.edu.

**Histotechnician Certificate**

Admission to the certificate program is open to all individuals who meet the following requirements:

1. Associate degree
2. Introduction to Chemistry (Chem 115/L, 4 credits)
3. Concepts of Biology (Biol 111/L, 4 credits)
4. Math at college level
5. Verification of a cumulative GPA of 2.8 on a scale of 4.0
6. Completion of the Biology and Chemistry courses with a C or better
7. Criminal background check
8. Immunization records
9. Verification of acceptance by a clinical site that meets the specification for acceptance in the Histotechnician Certificate Program

**Curriculum:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT 360</td>
<td>Histopathology Laboratory Theory</td>
<td>3</td>
</tr>
<tr>
<td>HT 362</td>
<td>Histotechniques I</td>
<td>3</td>
</tr>
<tr>
<td>HT 363</td>
<td>Histotechniques II</td>
<td>3</td>
</tr>
<tr>
<td>HT 367</td>
<td>Histology Practicum I</td>
<td>5</td>
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<tr>
<td>HT 368</td>
<td>Histology Practicum II</td>
<td>5</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

- Online course
- Clinical Internship at accredited medical center

**Honors (Hon)**

http://und.edu/honors-program/

Connecting accomplished students with engaged faculty from across the campus, the UND Honors Program is a holistic learning community that cultivates the next generation of thinkers to positively impact the world.

Students in the Honors Program have many opportunities to develop their own ideas and their writing and research skills; they also benefit from close association with faculty and other students who share their intellectual interests. Honors Program courses encourage students to think critically; express their thoughts clearly; both orally and in writing; expand their perspectives on the world; develop as citizens; understand the nature of scholarly inquiry; and forge connections among disciplines. Successful completion of the Program is a clear signal to prospective employees and graduate or professional schools that the graduate is a serious, well-prepared, accomplished student.

Students may participate in the Honors Program throughout their undergraduate career to earn Essential Studies credits or, additionally, to earn a BA or BS in Honors. Many students use Honors with a second major in a discipline of their choice.

Students are encouraged to apply at the time of their initial application to UND. Students may also enter the Program after the first semester. Inquiries from interested students are welcome. Please phone (701) 777-2219 or email honors@und.edu. Students in any college, department, or major at UND may enroll in the Honors Program. More information on the program is available on our web site (http://und.edu/honors-program/). For a full description of the Honors Program, see the University Information (p. 14) section.

**Graduation as a Scholar in the Honors Program**

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution), including:

I. Twenty-four credits of Honors coursework, eight of which must be taken in colloquia. Honors sections of courses offered by other departments may also count for a portion of the 24 credits. Nine senior Honors thesis credits, to be taken over a minimum of two semesters, also count toward the 24 credits.

II. Sophomore Honors Portfolio, submitted upon completion of nine Honors credits.

III. Senior Honors Thesis.

Note: Honors Program requirements may substitute for the University Essential Studies Requirements.

**Courses**

**HON 101. Inquiry in the Humanities. 3 Credits.**

Reading and discussion of selected works that reflect the methodology and concerns of the humanities, with emphasis on US Diversity; orientation to methods of Honors work. Taken by first-year candidate-members in the Honors Program. Prerequisite: Admittance to the Honors Program. F.

**HON 102. Inquiry in the Social Sciences. 3 Credits.**

Readings and discussion of selected works that reflect the methodology and concerns of the social sciences, with emphasis on US Diversity; orientation to methods of Honors work. Taken by first-year candidate-members of the Honors Program. Prerequisite: Admittance to the Honors Program. F.

**HON 103. Inquiry in the Sciences. 3 Credits.**

Readings and discussion of selected works that reflect the methodology and concerns of the sciences; orientation to methods of Honors work. Taken by first-year candidate-members of the Honors Program. Prerequisite: Admittance to the Honors Program. F.

**HON 250. Sophomore Portfolio Workshop. 1 Credit.**

An in-depth portfolio used to evaluate writing at the sophomore level. Prerequisite: Admittance to the Honors Program. F.S.

**HON 272. Social Science Colloquium on US Diversity. 3 Credits.**

This course is designed to provide a Social Sciences based, Essential Studies course that meets the US Diversity overlay requirements. F.S.

**HON 291. Colloquium in the Humanities. 3 Credits.**

Interdisciplinary courses on varying topics related to the humanities; student participation in the form of writing, research, and discussion is stressed. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

**HON 292. Colloquium in Social Science. 3 Credits.**

Interdisciplinary courses on varying topics related to the social sciences; student participation in the form of writing, research, and discussion is stressed. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

**HON 293. Colloquium in the Sciences. 3 Credits.**

Interdisciplinary courses on varying topics related to the sciences; student participation in the form of writing, research, and discussion is stressed. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

**HON 301. Honors Mode. 1 Credit.**

A method of using a 1 credit study load to increase the level of any standard course to an Honors quality course. It provides an intellectual enhancement to a standard course. Prerequisite: Standard course which Honors Mode complements; see department for approval. F.S, SS.

**HON 372. Advanced Social Science Colloquium on US Diversity. 3 Credits.**

This course is designed to provide an Essential Studies Social Sciences-based, US Diversity overlay course. F.S.
HON 381. Exploring Global Diversity through Humanities, 3-4 Credits.
This course is designed to give students a study abroad experience without
having to spend an entire semester abroad. During the semester the students
will study the history, art, literature, culture and language of a chosen country.
While it is possible that other aspects of the country will be studied the
emphasis will be on Humanities subject areas. At the end of spring semester
the instructor, students and other chaperones (as needed) will travel to the
studied country for 10 to 14 days. The travel will be a requirement. Repeatable.
S, odd years.

HON 382. Exploring Global Diversity through Social Science, 3-4 Credits.
This course is designed to give students a study abroad experience without
having to spend an entire semester abroad. During the semester the students
will study the history, geography, government, politics and culture of a chosen country. While it is possible that other aspects of the country will be studied the emphasis will be on Social Science subject areas. At the end of spring semester the instructor, students and other chaperones (as needed) will travel to the studied country for 10 to 14 days. The travel will be a requirement. Repeatable. S, even years.

HON 391. Advanced Colloquium in the Humanities. 1-4 Credits.
Advanced interdisciplinary courses on varying topics in the humanities. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

HON 392. Advanced Colloquium in the Social Sciences, 1-4 Credits.
Advanced interdisciplinary courses on varying topics in the social sciences. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

HON 393. Advanced Colloquium in the Sciences, 1-4 Credits.
Advanced interdisciplinary courses on varying topics in the sciences. Repeatable. Prerequisite: Admittance to the Honors Program. Repeatable. F.S.

HON 395. Prospectus Development. 1 Credit.
An introduction to the senior thesis process. Students will design a senior thesis project and write a prospectus for submission to the Honors Committee. Prerequisites: Junior standing and full membership in Honors Program. S/U grading. F.S.

HON 399. Independent Study, 1-4 Credits.
Individual instruction on specified topics arranged by mutual agreement among teacher, student, and the Program. Repeatable to 12 credits. Prerequisite: Admittance to the Honors Program. Repeatable to 12 credits. F.S.

HON 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Prerequisites: Consent of the Department and approval of the Honors Committee, and ENGL 130. Repeatable to 9 credits. F.S.

Humanities (Hum)

http://www.arts-sciences.und.edu/humanities

Carmichael (Director), Kerr, Lauritzen, Leber-Gottberg, Magness, and Park

Remembering history, imagining the future: the Humanities include a broad category of disciplines such as the classics, literature, languages, history, music, visual and performing arts, philosophy, and religion, all of which are concerned with studying aspects of the human condition, what it means to be human. Through a process of asking questions, evaluating assumptions, and analyzing beliefs, students of the Humanities reflect on what they know, assess what they think, and judge why they think it. This type of exploration demands disciplined thought, clear articulation of ideas, and cooperative discussion as preparation for the complex decisions and judgments that life and work present.

The mission of the Humanities Program is to provide courses which meet the University’s Essential Studies (general education) requirements. Emphasis is placed on small group discussion, critical reading of classical and modern texts, and written responses to the materials of the course. Reading, writing, research, dialogue, and conversation are central to class meetings. The study of the Humanities promotes the development of many important skills:

- reading
- writing
- critical thinking (reasoning, organizing ideas, making distinctions, recognizing important similarities, grasping what is essential)
- decision-making (maturity and refinement of judgment, ability to give good reasons)
- communication (clear, cogent expression of ideas and beliefs, both orally and in written form)
- self-understanding
- valuation (ability to deal rationally with questions of value, to set priorities and balance competing ideals)
- cross-cultural awareness
- aesthetic sensibility
- civic responsibility

The Humanities Program also administers the Integrated Studies Program, a nationally-known, award-winning interdisciplinary Essential Studies (general education) program for first year students. See the Integrated Studies Program (p. 152) listing for more information.

Courses

HUM 101. The Human Experience. 4 Credits.
This course uses the individual human experience as a lens for viewing ways of thinking across disciplines, drawing primarily on concepts and methodologies from the humanities but also incorporating ideas from the social sciences and the sciences. Materials chosen each semester will vary, often focusing on a central theme. This course helps students begin to develop competencies in problem solving, personal development, and relating to others. Students may be expected to attend events outside of class. F.S.

HUM 101L. Humanities Recitation.

HUM 102. The Human Community. 4 Credits.
While this course has the same structure and goals as Humanities 101, its subject matter will focus primarily on the methods and expressions of human interactions within communities, with a focus on texts and artifacts that articulate the growth of human consciousness, responsibility, and potential. The texts chosen for this course will require students to compare and contrast ancient and modern ideas in the major disciplines of the humanities. Students may be expected to attend events outside of class. F.S.

HUM 212. Integrated Cultural Experience. 3 Credits.
This course seeks to examine human concerns and motivations through the examination of artistic and cultural expressions. Students will attend and analyze various types of cultural events, including dramatic productions, art shows, films, and music concerts to examine the sub-text of the human condition. They will also study texts in which authors present philosophies regarding the nature of art and the importance of particular mediums (poetry, visual arts, film, etc.) in voicing personal and social concerns. In addition, students will study the philosophy of philanthropy by researching and gaining personal experience in a community service activity. Prerequisite: Consent of instructor. F.S.

HUM 224. Integrated Social Science Inquiry. 2-4 Credits.
Readings and discussion of selected works that reflect the methodology and concerns of the social sciences; integration of social science topics and methods with other Integrated Studies courses/topics. F.S.

HUM 225. Advanced Integrated Social Science. 2-4 Credits.
A continued, in-depth exploration of social science topics raised in Integrated Social Science (224). This course will require that students pursue more advanced research in and consideration of topics included in the social sciences as they relate to the Integrated Studies Program theme. F.S.

HUM 270. Integrated Studies Life Sciences. 3 Credits.
Through a variety of media and experiences, ISP Life Sciences explores historical and modern developments in the Life Sciences that have altered the conception of what it means to be human. ISP Life Sciences is an interdisciplinary examination of the core concepts of Life Sciences that may include genetics, evolution, and ecology through the process of scientific inquiry. No laboratory. F.S.

HUM 271. Integrated Studies General Science. 3 Credits.
Through a variety of media and experiences, General Sciences explores historical and modern developments in the Physical Sciences that have altered the conception of how our world and universe work and the place of humans within it. This course an interdisciplinary examination of the core concepts of Physical Sciences that may include cosmology, environment, climate, and sustainability through the process of scientific inquiry. F.S.
HUM 271L. Integrated Studies General Science Laboratory. 1 Credit.
Three-hour weekly laboratory to complement General Science 271. This hands-on lab experience in scientific discovery utilizes the scientific method. Students develop the skills to design, conduct, and analyze their own experiments motivated by their own observations and curiosity. This lab experience emphasizes the link between science and the real world. Labs can range from food science to human behavior. Prerequisite or corequisite: HUM 271. F,S.

HUM 283. Evidenced Based Reasoning Across Disciplines. 3 Credits.
In this course, students will examine chosen issues in the sciences, social sciences, and humanities and will gain a general familiarity with the academic and popular forms of writing, evidence-based reasoning, and research in each discipline. They will become familiar with the research methodologies of each discipline and learn to integrate the different methods and perspectives with their own analysis. F,S.

HUM 300. Knowledge, Truth and Reality. 1-3 Credits.
An interdisciplinary exploration of the nature of knowledge, truth, and reality from the perspectives of science, philosophy, and religion. On demand.

HUM 312. Creative Inquiry. 1 Credit.
This hands-on course allows students to deeply pursue and attempt to solve problems that spring from their own curiosity, from a professor's challenge, or from the pressing needs of the world around them. Course options may vary from a focused analysis of a current problem to team-based investigations led by a faculty mentor or creative endeavor. The purpose of the course activities are to allow students to experience and engage in creative activities or hands on research/problem solving, providing them with deep learning opportunities where they can develop critical thinking skills, team-based problem solving skills, and collaboration, communication, and presentation skills. Offered as needed by permission of department. Repeatable when topics vary up to three times. Repeatable to 3 credits. F,S.

HUM 325. Interdisciplinary Global Human Rights. 3 Credits.
This course addresses a variety of current international issues from multiple perspectives and through a lens of interdisciplinarity. Through the study of global issues and topics, students will read, write, and discuss topics of international concern affecting human rights today and the future of the global common. This discussion based course will utilize readings, current events, and other media focusing on critical and creative thinking, and collaborative problem-solving in addressing current world problems. F,S,SS.

HUM 391. Advanced Humanities Seminar. 1-4 Credits.
An interdisciplinary reading, writing and discussion course whose focus varies from semester to semester, but which draws on texts from the Humanities, Social Sciences, and Sciences. Repeatable. F,S,SS.

HUM 408. Writing Across the Disciplines. 3 Credits.
This senior level course will provide students with an intensive writing experience that focuses on methods and strategies in the humanities, social sciences, and sciences. Students will gain an understanding of the theoretical underpinnings of the disciplines while they engage in the process of integrating disciplinary materials and writing tactics as well as formulating written responses to topics of current concern. Prerequisites: ENGL 120 or ENGL 125 or ENGL 130 and Junior/Senior standing. F,S.

HUM 392. Oral Communication. 3 Credits.
Shows possible areas of concentration. Oral Communication emphasizes the link between spoken performance and the social world. This course is part of the Integrated Studies program, which focuses on developing the communication skills necessary for success in today's world. Students will learn to develop and present ideas in a variety of contexts and will be assessed on their ability to communicate effectively in both oral and written formats. Prerequisite: HUM 283. F,S.

HUM 393. Integrated Studies Seminar. 1-4 Credits.
An interdisciplinary seminar on a topic relevant to the humanities. Course options may vary from a focused analysis of a current problem to team-based investigations led by a faculty mentor or creative endeavor. The purpose of the course activities are to allow students to experience and engage in creative activities or hands on research/problem solving, providing them with deep learning opportunities where they can develop critical thinking skills, team-based problem solving skills, and collaboration, communication, and presentation skills. Offered as needed by permission of department. Repeatable when topics vary up to three times. Repeatable to 3 credits. F,S.

HUM 394. Writing Across the Disciplines. 3 Credits.
This senior level course will provide students with an intensive writing experience that focuses on methods and strategies in the humanities, social sciences, and sciences. Students will gain an understanding of the theoretical underpinnings of the disciplines while they engage in the process of integrating disciplinary materials and writing tactics as well as formulating written responses to topics of current concern. Prerequisites: ENGL 120 or ENGL 125 or ENGL 130 and Junior/Senior standing. F,S.

Integrated Studies

http://www.und.edu/integrated-studies

Carmichael (Director), Kerr, Leber-Gottberg, Magness, and Park

(The permanent faculty is supplemented by faculty from other University departments.)

UND’s exceptional learning community, the Integrated Studies Program (ISP), is nationally-known and award-winning. Housed in the Humanities department at the University, ISP:

• allows you to earn required Essential Studies (general education) credits in a unique way which fits with any 4-year plan;
• gives you the opportunity to participate in a student-focused learning community with small class sizes, meet students from around the nation, and develop close friendships;
• provides an option allowing you to explore topics about real-world issues;
• engages you in courses taught by faculty from various fields;
• presents opportunities for learning outside the classroom through cultural events and field trips.

Through a process of asking questions, evaluating assumptions, and analyzing beliefs, ISP students, taking between two to four courses in the Program each semester, will reflect on what they know, assess what they think, and judge why they think it. This type of exploration demands disciplined thought, clear articulation of ideas, and cooperative discussion and problem-solving as preparation for the complex decisions and judgments that life and work present. And by emphasizing these areas, the Program provides an opportunity to enhance skills employers seek.

All courses in Integrated Studies help students fulfill Essential Studies (general education) requirements necessary for all University undergraduate degrees. (See University Essential Studies listing for more information.) Each semester includes options for receiving credit from the following Essential Studies categories: Communications, Social Sciences, Arts and Humanities, and Math/Science/Technology. Information on most course offerings can be found under the Humanities department listing.

Below is an example of Essential Studies information and how ISP can help you fulfill credits in the various categories. Both a fall and a spring semester experience in the Program are offered; the total number of credits and their category distribution vary semester by semester.

<table>
<thead>
<tr>
<th>Department</th>
<th>Required Credits at UND</th>
<th>ISP Classic* fall semester example</th>
<th>ISP Lite* fall semester example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>9</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>9</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>9</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Math, Science, Technology</td>
<td>9</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

*ISP Classic is a good option for you if you are interested in an intensive learning community experience and do not need to take several specific courses for a major in your first year of college. ISP Lite is a good option for you if you know you need to take some classes right away that are required for your major.

To emphasize and build connections between disciplines, all class activities and discussions are organized around a central theme. Class meetings include a variety of small group settings in which discussion among students is emphasized. In addition, students enrolled in these classes form a supportive learning community: they spend the entire semester studying the same materials together and form close relationships with each other and with the faculty team. The Program provides students an opportunity to hone skills such as:

• Integrating topics from classes together, as well as with their daily lives
• Critical thinking and problem solving, creative thinking, and collaboration
• Writing
• Close reading of texts
• Cooperative work
• Oral communication

Integrated Studies works well with most majors at UND and should appeal to students at all levels of academic proficiency. ISP Classic is particularly recommended for students interested in education, communication, or pre-law studies, and for deciding students: ISP Lite is a great option for pre-health fields, aviation and engineering majors. Students enrolled in the UND Honors Program may apply Integrated Studies credits toward their Honors requirements.

Students interested in the Integrated Studies Program can call (701) 777-3622, or write to Humanities and Integrated Studies, O’Kelly Hall Room 253, 221 Centennial Dr., Stop 7117, Grand Forks, ND 58202-7117. Information about the Program is also available online at: http://www.und.edu/integrated-studies. The Program’s office is located on the second floor of O’Kelly Hall, Room 253, on the University campus.
Interdisciplinary Studies (IDS)

Rundquist (Interim Director)

http://www.arts-sciences.und.edu/interdisciplinary-studies

The Interdisciplinary Studies (IDS) program offers students a unique opportunity to pursue a major from an interdisciplinary perspective. Students learn to gather knowledge from a range of disciplines when considering a specific issue or problem, and to then integrate that knowledge into a solution. The goal is to improve a student’s ability to think critically, recognize biases, and act ethically.

There are several pathways to earning a Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) degree in Interdisciplinary Studies, namely: 1) Women and Gender Studies (http://und-public.coursesleaf.com/undergraduateacademicinformation/departments/coursesprograms/womenandgenderstudies) B.A.; 2) Peace Studies (http://und-public.coursesleaf.com/undergraduateacademicinformation/departmentalcoursesprograms/peacestudies) B.A.; and 3) Customized Plan of Study B.A. or B.S.

Women and Gender Studies and Peace Studies are high-quality, long-standing programs at UND. These pathways are described elsewhere, but the major is administered through IDS.

Students in the Customized Plan of Study Pathway can take charge of their own education by designing a plan of study focusing on a topic of interest, in consultation with the program director and, if appropriate, one or more other UND faculty advisors. In these individualized tracks, students undertake an in-depth study of a topic area of their choice that synthesizes information and research from two or more disciplines.

College of Arts and Sciences

B.A. or B.S. with Major in Interdisciplinary Studies

Required 125 credits, 36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution including:

I. Essential Studies Requirements. It is recommended that students include at least one semester, if not a full year, of Integrated Studies.

II. A minimum of 36 credits, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM 283</td>
<td>Evidenced Based Reasoning Across Disciplines</td>
<td>3</td>
</tr>
<tr>
<td>HUM 408</td>
<td>Writing Across the Disciplines</td>
<td>3</td>
</tr>
<tr>
<td>or IDS 495</td>
<td>Service and Citizenship</td>
<td>3</td>
</tr>
</tbody>
</table>

The remainder of the 36 credits will be chosen from appropriate specified disciplines, including 12 or more hours from one discipline.

Courses

IDS 280. Learning Across Disciplines. 3 Credits.

The course will examine the nature of disciplines and fields and the way in which knowledge is organized. Basic assumptions and orientations will be compared and contrasted for scientific, social scientific, and humanities areas. Current literature in the field of interdisciplinary studies will be presented. F.S.

IDS 399. Interdisciplinary Topics. 1-3 Credits.

Topics, problems, or texts that connect or draw upon two or more academic disciplines will be studied. Repeatable when topics vary. Regular or S/U grading. Repeatable to 9 credits. F,S,SS.

IDS 491. Capstone Interdisciplinary Seminar. 1-3 Credits.

This seminar will be organized by the director of the Interdisciplinary Studies Program to act as a point of reference for students working on their Senior Projects in the program. The projects will vary from semester to semester, so the focus will shift accordingly. Not repeatable. Prerequisite: IDS 280. Corequisite: IDS 498. S.

IDS 495. Service and Citizenship. 3 Credits.

Students will design community service projects, or will join existing projects, and engage in volunteer action during the semester. Class meetings on campus will center on a critical discussion of volunteerism and community service; current literature on service learning will be studied. Self-assessment of experiential learning outcomes, as well as a portfolio and essay will be required. Prerequisite: Junior or Senior standing. F,S,SS.

IDS 498. Senior Project. 3 Credits.

The project will be designed on an area of interest which the student has defined. It will include data or material from a variety of disciplines or fields which the student finds relevant to the issue under study. The student will synthesize the cross-cutting information into a creative/original whole and discuss applications of this new approach. Repeatable to 6 credits. Prerequisite: IDS 280. Corequisite: IDS 491. Repeatable to 6 credits. F.S.

International Studies (A&S)

http://arts-sciences.und.edu/international-studies/index.cfm

Routon (Director)

The Related Fields Concentration in International Studies, housed in the Languages Department, is designed to offer students an opportunity to gain global perspectives, to pursue greater understanding of our interconnected world, and to prepare to apply those insights to a variety of professions. The program is intended for students who have an interest in an international area or concentration that is currently not offered through existing departments. The subject matter is vast and the professional and personal opportunities for utilizing it are rich and varied. Therefore, the program is designed to provide considerable latitude in matching the specific content of individual programs to the needs and goals of students. Students will be required to work closely with their academic advisers to plan the best possible program within the possibilities provided by the Related Fields Concentration.

College of Arts and Sciences

B.A. with Major in International Studies

A major in International Studies consists of 30 credits plus language credits. Students are required to participate in a study abroad experience through a University sponsored program. The program is organized around several categories: Language; Introduction and Capstone; Discipline Diversity; Regional & Thematic Diversity; Regional Diversity Outside of Concentration; and Study Abroad.

Language The foreign language requirement has two options: Option 1 Level IV second language proficiency plus two courses at the 300/400 levels in the same language. 300/400 level courses in languages can be counted towards the Regional & Thematic concentration (6 courses, 22 credits); Option 2 Level IV proficiency in second language plus level II proficiency in third language (6 courses, 24 credits)

Introduction to International Studies & Capstone: required unless authorized substitution

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANG 380</td>
<td>Global Gateways</td>
<td>3</td>
</tr>
<tr>
<td>LANG 480</td>
<td>Capstone: Global Connections</td>
<td>3</td>
</tr>
</tbody>
</table>

Discipline Diversity: 6 credits from the courses below in different departments.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 228</td>
<td>Diversity in Global Literatures</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 242</td>
<td>World Literature II</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 250</td>
<td>Introduction to Geopolitics</td>
<td>3</td>
</tr>
<tr>
<td>HIST 105</td>
<td>World Civilizations I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>World Civilizations II</td>
<td>3</td>
</tr>
<tr>
<td>POLS 220</td>
<td>International Politics</td>
<td>3</td>
</tr>
<tr>
<td>POLS 225</td>
<td>Comparative Politics</td>
<td>3</td>
</tr>
<tr>
<td>RELS 203</td>
<td>World Religions</td>
<td>3</td>
</tr>
</tbody>
</table>
Regional & Thematic Concentration

15 credits at the 300/400 levels with approval. Normally some of the credits will be fulfilled through Study Abroad.

Regional Diversity

3 credits at the 300/400 level from a region outside of the Regional & Thematic Concentration with approval.

Study Abroad

6-12 credits with approval by the International Studies adviser to be integrated with Foreign Language and/or Regional & Thematic Concentration requirements.

Minor in International Studies

A minor in International Studies consists of 12 credits plus 16 language credits. Students are encouraged to participate in a study abroad experience through a University sponsored program.

Foreign Language Level IV Proficiency

Discipline Diversity

6 credits from the courses below in different departments.

ANTH 171 Introduction to Cultural Anthropology 3
ENGL 228 Diversity in Global Literatures 3
ENGL 242 World Literature II 3
GEOG 161 World Regional Geography 3
GEOG 250 Introduction to Geopolitics 3
HIST 105 World Civilizations I 3
HIST 106 World Civilizations II 3
POLS 220 International Politics 3
POLS 225 Comparative Politics 3
RELS 203 World Religions 3

Approved Equivalent

Regional Diversity

6 credits at the 300/400 level with approval by International Studies adviser.

Kinesiology and Public Health Education (KPHE)

http://education.und.edu/kphe

Pearson (Chair), Fitzgerald, Rhoades, Sabato, Short, S. Short, G. Tomkinson, Walch, and Whitehead

Recognizing that the health and wellness of the population depends largely on the lifestyles of its citizens, the Department of Kinesiology and Public Health Education (KPHE) strives to play a key role in educating about and promoting lifestyle behaviors (e.g., physical activity and sport) and environmental factors (e.g., advocacy) that facilitate comprehensive health and wellness, and in minimizing modifiable risk behaviors and factors (e.g., tobacco use, alcohol abuse) that may adversely impact health and wellness. With a vision of improving health and wellness across the lifespan, locally and afar, the department goals include:

- Preparing future leaders for careers in the health professions, including educational, laboratory, clinical, community, and exercise and sport settings;
- Providing educational opportunities to the University of North Dakota community to learn and apply both knowledge and decision-making skills which relate to healthy lifestyles;
- Engaging in and sharing, through collaborative scholarship, the discovery of new knowledge and applied methods that enable individuals and communities to live healthier lives; and
- Offering expertise and service to both the local and broader community and profession.

Graduates have the opportunity to pursue careers in physical education teaching, public health education, fitness and wellness education, leadership and management, athletic coaching, or to continue their education in graduate or professional studies (See Kinesiology, Master’s Program).

Basic Instruction Program Courses (BIP). The Department of Kinesiology and Public Health Education also provides beginner, intermediate and advanced instruction for all students of the University in a wide variety of activities, such as aquatics, individual sports and activities (including combative sports, dance, fitness and conditioning, gymnastics, outdoor pursuits, racquet sports, strength training, and target sports) and team sports. Credits obtained from participation in these activity courses may count toward the credits required for graduation. These credits may be earned by enrolling in the various activities offered under the KIN 100-118 (beginner), 120-138 (intermediate), and 140-158 (advanced) course numbers. Specific course offerings are listed in the current schedule of courses. Students are generally required to bring their own equipment, although in some cases, equipment is provided by the department. Each BIP course has a $60 fee to help pay for the cost of equipment, instruction and administrative costs. There may also be fees assessed for some activities that require facility rental.

Undergraduate programs offered by the Department of Kinesiology and Public Health Education in the College of Education and Human Development are:

A. Major in Kinesiology: consists of a core of courses and one specialization: health education in grades K-12; related area (Option B), which permits a student to study kinesiology and a related subdiscipline; Kinesiology applications area (Option C) for those students who wish to focus within wellness/fitness fields or pursue graduate or professional studies; and allied health (Option D) for those students wishing to pursue pre-allied health fields of professional study.

B. Major in Public Health Education: will expose students to the five core public health areas, including epidemiology, biostatistics, social and behavioral science, health policy and management, and environmental health. Graduates of the Public Health Education program will be prepared to work in a variety of settings, including local or state health departments, health services administration, corporate and worksite wellness programs, scientific research, general medical and surgical hospitals, parks and recreation, non-profit organizations and many others.

C. Minor in Athletic Coaching: offered to students who wish to prepare for athletic coaching.

D. Minor in Health Education: provides partial preparation for school health teaching.

Important: To declare as a KIN major, a student must have successfully completed a criminal background check. In order to take the following courses* students must have major status and a satisfactory background check; however, non-majors may take these classes with department consent and a satisfactory background check:

- KIN 355 Applied Motor Development 3
- KIN 400 Methods and Materials for Teaching Physical Education Elementary School 4
- KIN 404 Adapted Physical Activity 3
- KIN 410 Methods and Materials for Teaching Physical and Health Education in the Secondary School 4
- KIN 491 Senior Capstone 3
- KIN 495 Service Learning in KIN 2
- KIN 496 Field Study in KIN 1-8
- KIN 497 Internship in KIN 10
- KIN 498 Practicum in Coaching 2
- T&L 487 Student Teaching (Option A students only) 4-16

* Courses which may involve contact with P-12 students or vulnerable populations.

B.S. Public Health Education (B.S.P.H.E.) (p. )
B.S. Kinesiology (B.S.KIN.)

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Education and Human Development Requirements (see College [p. 615] listing).

III. Prerequisite courses and requirements, 19 credits, including: (**courses may be used to satisfy the Essential Studies requirements).

1. Criminal Background Check
2. Coursework:
   3. CHEM 115 & 115L and Introductory Chemistry Laboratory **
   4. PSYC 111 Introduction to Psychology **
   3. SOC 110 Introduction to Sociology
   3. ANAT 204 & 204L Anatomy for Paramedical Personnel and Anatomy for Paramedical Personnel Laboratory
   4. PPT 301 Human Physiology
   Total Credits 19

As soon as these prerequisite courses and requirements have been completed, KIN pre-majors should see the KIN undergraduate advisor to apply for KIN major status.

IV. KIN core requirements, 32 credits including:

   KIN 207 Prevention and Care of Physical Activity Injuries
   NUTR 240*
   KIN 276 Motor Learning
   & 276L Motor Learning Lab
   KIN 326 Fundamentals of Physical Conditioning
   KIN 332 Biomechanics
   & 332L Biomechanics Laboratory
   KIN 355 Applied Motor Development*
   KIN 401 Sport Sociology
   KIN 402 Exercise Physiology
   & 402L Exercise Physiology Laboratory
   KIN 404 Adapted Physical Activity*
   KIN 440 Sport Psychology
   Total Credits 32

V. One of the following options:

A. Teacher Education/Certification (134 credits)

   Students seeking certification to teach physical education must be admitted to the Teacher Education program which requires a minimum of 2.75 GPA, adequate test scores, and at least 30 credits before applying for admission to Teacher Education. Students must also complete the KIN core requirements (listed above) plus additional courses specific to the preparation for teaching in physical education, including the following courses:

   T&L 250 Introduction to Education
   T&L 252 Child Development
   T&L 339 Technology for Teachers
   KIN 220-238
   KIN 290 Physical Education Activities for the Elementary Grades
   KIN 327 Fitness for Life
   KIN 390 Introduction to Teaching in Physical Education and Coaching
   KIN 390L Introduction to Teaching in Physical Education and Coaching Laboratory
   KIN 400 Methods and Materials for Teaching Physical Education Elementary School
   KIN 400L Methods and Materials for Teaching Physical Education in the Elementary School - Laboratory
   KIN 403 School Health Education
   KIN 410 Methods and Materials for Teaching Physical and Health Education in the Secondary School
   KIN 410L Methods and Materials for Teaching Physical & Health Education in the Secondary School - Laboratory
   KIN 420 Curriculum Development for Physical and Health Education
   T&L 433 Multicultural Education
   KIN 491 Senior Capstone

   As soon as these prerequisite courses and requirements have been completed, KIN pre-majors should see the KIN undergraduate advisor to apply for KIN major status.

   Additional requirements for the teacher education/certification option include:

   1. Admission to the Teacher Education program (see details under the College of Education and Human Development [p. 615] or on the Teacher Education website.) Note that many upper division courses are not open to students until they gain TE admission.
   2. Student teaching at two levels: elementary and secondary (8 credits each, totaling 16 credits). Student teachers are also required to take KIN 491 Senior Capstone, during their student teaching semester.

B. Related Areas

KIN core requirements, plus the following:

   1. Students will complete another major and/or minor in a subject area related to kinesiology.
   2. KIN 220-238: Movement Performance and Analysis, 3 credits total (1 aquatic, 1 individual sport/activity, and 1 team sport).
   3. The remaining credits to satisfy the University minimum Graduation Requirements of 125 credits will be chosen from elective courses with the consent of the advisor.

C. Kinesiology Applications Area

   1. KIN core requirements, plus the following (for an additional minimum of 24 credits)
   2. Required courses (16 credits) include:
   3. KIN 220-238 (1 aquatic, 1 individual sport/activity & 1 team sport) 3
   4. KIN 446 Exercise Testing and Prescription
   5. KIN 497 Internship in KIN 10
   6. Electives (a minimum of 8 credits from the following):
   7. KIN 240 Introduction to Wellness
   8. KIN 327 Fitness for Life
   9. KIN 375 Fundamentals of Group Exercise Instruction
   10. KIN 376 Professional Skills in Personal Training
   11. KIN 434 Strength Training: Coaching Methods

D. Allied Health

   1. KIN core requirements, plus the following:
   2. KIN 220-238: Movement Performance and Analysis, 3 credits total (1 aquatic, 1 individual sport/activity and 1 team sport)
   3. A pre-professional program in pre-med, pre-physical therapy, pre-occupational therapy, pre-chiropractic, pre-physician assistant or other
   4. approved pre-allied health science fields.

B.S. Public Health Education (B.S.P.H.E.)

Required 125 credits (36 credits numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements, 39 credits. The program includes the 39 credits that all students are required to complete in order to meet Essential Studies requirements (see University ES listing).

II. Prerequisite Courses, 9 credits, including:
ANAT 204   Anatomy for Paramedical Personnel  5  
& 204L and Anatomy for Paramedical Personnel Laboratory  
PPT 301 Human Physiology  4  
Total Credits  9  

One of the following pairs of courses is required as a prerequisite for PPT 301 Human Physiology:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L and General Biology I Laboratory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 116</td>
<td>Introduction to Organic and Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 116L and Introduction to Organic and Biochemistry Laboratory</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

One of these courses may also be used to meet the ES Breadth of Knowledge requirement for Math, Science, and Technology.

## III. Health-Related Core Requirements, 18 credits, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHE 101</td>
<td>Introduction to Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PHE 102</td>
<td>Epidemiology in Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PHE 103</td>
<td>Introduction to Global Health</td>
<td>3</td>
</tr>
<tr>
<td>KIN 110</td>
<td>First Aid and CPR</td>
<td>1</td>
</tr>
<tr>
<td>KIN 240</td>
<td>Introduction to Wellness</td>
<td>2</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>Fitness for Life</td>
<td>3</td>
</tr>
<tr>
<td>KIN 327</td>
<td>Public Health Internship</td>
<td>15</td>
</tr>
</tbody>
</table>

Total Credits  18

## IV. One of the following options:

### A. Public Health Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHE 301</td>
<td>Principles and Foundation of Health Education</td>
<td>3</td>
</tr>
<tr>
<td>PHE 302</td>
<td>Community Health</td>
<td>3</td>
</tr>
<tr>
<td>PHE 303</td>
<td>Organization and Administration of Community Health Programs</td>
<td>3</td>
</tr>
<tr>
<td>PHE 304</td>
<td>Health Program Planning and Implementation</td>
<td>3</td>
</tr>
<tr>
<td>PHE 305</td>
<td>Program Evaluation and Research Design</td>
<td>3</td>
</tr>
<tr>
<td>PHE 306</td>
<td>Epidemiology and Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PHE 307</td>
<td>Methods and Materials of Health Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits  36

### B. School Health Education:

Students seeking certification to teach health education must be admitted to the Teacher Education program which requires a minimum of 2.75 GPA, adequate test scores, and at least 30 credits before applying for admission to Teacher Education. Students must also complete the PHE prerequisites and core requirements (listed above) plus additional courses specific to the preparation for teaching in health education, including the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 210</td>
<td>Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td>SOC 335</td>
<td>Families in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
<td>3</td>
</tr>
<tr>
<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402</td>
<td>Exercise Physiology</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402L</td>
<td>Exercise Physiology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>KIN 403</td>
<td>School Health Education</td>
<td>2</td>
</tr>
<tr>
<td>KIN 404</td>
<td>Adapted Physical Activity</td>
<td>3</td>
</tr>
<tr>
<td>KIN 355</td>
<td>Applied Motor Development</td>
<td>3</td>
</tr>
<tr>
<td>PHE 302</td>
<td>Community Health</td>
<td>3</td>
</tr>
<tr>
<td>PHE 304</td>
<td>Health Program Planning and Implementation</td>
<td>3</td>
</tr>
<tr>
<td>PHE 305</td>
<td>Program Evaluation and Research Design</td>
<td>3</td>
</tr>
<tr>
<td>PHE 307</td>
<td>Methods and Materials of Health Education</td>
<td>3</td>
</tr>
<tr>
<td>PHE 415</td>
<td>Public Health Internship</td>
<td>15</td>
</tr>
</tbody>
</table>

Total Credits  18

With the exception of PSYC courses (which require PSYC 111 Introduction to Psychology as a prerequisite) and ANTH 371 Cultural Dynamics and ANTH 465 Culture, Illness and Health (which require ANTH 171 Introduction to Cultural Anthropology as a prerequisite) none of the above-noted electives requires a prerequisite.

## VI. Additional Requirement: All PHE Students are required to take KIN 491 Senior Capstone prior to graduation.

### Minor in Athletic Coaching

Required 27 credits, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 241</td>
<td>Introduction to Coaching</td>
<td>1</td>
</tr>
<tr>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
<td>3</td>
</tr>
<tr>
<td>KIN 220-238</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>KIN 390</td>
<td>Introduction to Teaching in Physical Education and Coaching</td>
<td>2</td>
</tr>
<tr>
<td>KIN 390L</td>
<td>Introduction to Teaching in Physical Education and Coaching Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>KIN 325</td>
<td>Youth and Children in Sport</td>
<td>3</td>
</tr>
<tr>
<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
</tr>
<tr>
<td>KIN 341</td>
<td>Organization and Administration of Athletics</td>
<td>2</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>KIN 420-438</td>
<td>(3 courses that are 2 credits each to coincide with specific KIN 220-238 courses)</td>
<td>6</td>
</tr>
<tr>
<td>KIN 498</td>
<td>Practicum in Coaching</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

Students interested in a Minor in Athletic Coaching should consult with an advisor in Kinesiology and Public Health Education before beginning the Minor. Doing so is necessary to ensure that courses are appropriately tracked toward the practicum.

### Minor in Health Education

Required 15 credits, including:

- PHE 101 Introduction to Public Health 3
- PHE 102 Epidemiology in Public Health 3
- PHE 103 Introduction to Global Health 3
- PHE 301 Principles and Foundation of Health Education 3
- PHE 304 Health Program Planning and Implementation 3

6 credits from the following group: 6

- KIN 108. Fitness and Conditioning I. 1 Credit.
- KIN 109. Target Sports I. 1 Credit.
- KIN 110. First Aid and CPR. 1 Credit.
- KIN 111. Individual Sports/Activities I. 1 Credit.
- KIN 112. Out door Pursuits I. 1 Credit.
- KIN 113. Racquet Sports I. 1 Credit.
- KIN 114. Strength Training I. 1 Credit.
- KIN 115. Team Sports I. 1 Credit.
- KIN 116. Gymnastics I. 1 Credit.
- KIN 117. Military Conditioning I. 1 Credit.
- KIN 118. Air Force Conditioning I. 1 Credit.
- KIN 119. Army Conditioning I. 1 Credit.
- KIN 120. Aquatics II. 1 Credit.
- KIN 121. Combative Sports II. 1 Credit.
- KIN 122. Dance II. 1 Credit.
- KIN 123. Fitness and Conditioning II. 1 Credit.

Total Credits 21

Special topics and other courses may be substituted only with Kinesiology and Public Health Education advisor approval.

Students interested in a Minor in Health Education should consult with an advisor in Kinesiology and Public Health Education before beginning the Minor.

### KIN Courses

#### KIN 104. Aquatics I. 1 Credit.
These courses are designed for beginners. They include instruction in various aquatics-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F,S,SS.

#### KIN 105. Combative Sports I. 1 Credit.
These courses are designed for beginners. They include instruction in various combative sports (e.g., boxing, kickboxing, etc.). For specific course content, see the current schedule of classes. F,S,SS.

#### KIN 107. Dance I. 1 Credit.
These courses are designed for beginners. They include instruction in various dance types (e.g., ballet, hip-hop, etc.). For specific course content, see the current schedule of classes. F,S,SS.

#### KIN 108. Fitness and Conditioning I. 1 Credit.
These courses are designed for beginners. They include instruction in various fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). For specific course content, see the current schedule of classes. F,S,SS.
KIN 131. Individual Sports/Activities II. 1 Credit.
Prerequisite: KIN 111 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various individual sports and activities (e.g., golf, ice skating, track and field events, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 132. Outdoor Pursuits II. 1 Credit.
Prerequisite: KIN 112 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 133. Racquet Sports II. 1 Credit.
Prerequisite: KIN 113 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various racquet sports (e.g., badminton, racquetball, tennis, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 134. Strength Training II. 1 Credit.
Prerequisite: KIN 114 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various types of strength training (e.g., body building, power lifting, weight training, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 135. Target Sports II. 1 Credit.
Prerequisite: KIN 115 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various target sports (e.g., trapshooting, skeet, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 136. Team Sports II. 1 Credit.
Prerequisite: KIN 116 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 137. Gymnastics II. 1 Credit.
Prerequisite: KIN 117 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various types of gymnastics (e.g., artistic, trampolining, tumbling, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 138. Military Conditioning II. 1 Credit.
This course provides intermediate level instruction in military conditioning.
Prerequisite: The course is for AFROTC enrolled students only. F.S.

KIN 138A. Air Force Conditioning II. 1 Credit.
This course is designed for intermediate level instruction, emphasizing on the Air Force components of physical fitness; cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student achieve a minimum score of 180 points total, in four events of the Air Force Personal Fitness Assessment (APFPA): push-ups, sit-ups, a 1.5 mile run and waist measurement. S.

KIN 138B. Army Conditioning II. 1 Credit.
This course is designed for intermediate level instruction, emphasizing on the Army components of physical fitness; cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student achieve a minimum score of 180 points total, in three events of the Army Personal Fitness Test (APFT): push-ups, sit-ups and a two mile run. S.

KIN 144. Aquatics III. 1 Credit.
Prerequisite: KIN 124 in the same activity or consent of the instructor. These courses provide advanced level instruction in various aquatics-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 145. Combative Sports III. 1 Credit.
Prerequisite: KIN 125 in the same activity or consent of the instructor. These courses provide advanced level instruction in various combative sports (e.g., boxing, kickboxing, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 147. Dance III. 1 Credit.
Prerequisite: KIN 127 in the same activity or consent of the instructor. These courses provide advanced level instruction in various dance types (e.g., ballroom, hip-hop, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 148. Fitness and Conditioning III. 1 Credit.
Prerequisite: KIN 128 in the same activity or consent of the instructor. These courses provide advanced level instruction in various fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 151. Individual Sports/Activities III. 1 Credit.
Prerequisite: KIN 131 in the same activity or consent of the instructor. These courses provide advanced level instruction in various individual sports and activities (e.g., golf, ice skating, track and field events, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 152. Outdoor Pursuits III. 1 Credit.
Prerequisite: KIN 132 in the same activity or consent of the instructor. These courses provide advanced level instruction in various outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 153. Racquet Sports III. 1 Credit.
Prerequisite: KIN 133 in the same activity or consent of the instructor. These courses provide advanced level instruction in various racquet sports (e.g., badminton, racquetball, tennis, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 154. Strength Training III. 1 Credit.
Prerequisite: KIN 134 in the same activity or consent of the instructor. These courses provide advanced level instruction in various strengths of strength training (e.g., body building, power lifting, weight training, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 155. Target Sports III. 1 Credit.
Prerequisite: KIN 135 in the same activity or consent of the instructor. These courses provide advanced level instruction in various target sports (e.g., trapshooting, skeet, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 156. Team Sports III. 1 Credit.
Prerequisite: KIN 136 in the same activity or consent of the instructor. These courses provide advanced level instruction in various team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 157. Gymnastics III. 1 Credit.
Prerequisite: KIN 137 in the same activity or consent of the instructor. These courses provide advanced level instruction in various types of gymnastics (e.g., artistic, trampolining, tumbling, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 158. Military Conditioning III. 1 Credit.
This course provides advanced level instruction in military conditioning.
Prerequisite: KIN 138 or consent of instructor. On demand.

KIN 158A. Air Force Conditioning III. 1 Credit.
This course is designed for advanced level instruction, emphasizing on the Air Force components of physical fitness; cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student achieve a minimum score of 180 points total, in four events of the Air Force Personal Fitness Assessment (APFPA): push-ups, sit-ups, a 1.5 mile run and waist measurement. S.

KIN 158B. Army Conditioning III. 1 Credit.
This course is designed for advanced level instruction, emphasizing on the Army components of physical fitness; cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student achieve a minimum score of 180 points total, in three events of the Army Personal Fitness Test (APFT): push-ups, sit-ups and a two mile run. On demand.

KIN 207. Prevention and Care of Physical Activity Injuries. 3 Credits.
A study of the prevention and care of injuries incurred by individuals in physical activity settings across the lifespan. Includes recommended first aid and CPR practices for the care of persons who have been injured. Prerequisite: KIN Majors Athletic Coaching Minors only. F.S.

KIN 207L. Prevention And Care Of Injuries Lab. 1 Credit.
Corequisite: KIN 207.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 104, 124, 144, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various aquatic-related activities (e.g., swimming, diving, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 105, 125, 145, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various combative sports (e.g., boxing, kickboxing, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 227. Dance: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 107, 127, 147, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 228. Fitness & Conditioning: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 108, 128, 148, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 231. Individual Sports/Activities: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 111, 131, 151, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various individual sports and activities (e.g., golf, ice skating, track and field events, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 112, 132, 152, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 113, 133, 153, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various racquet sports (e.g., badminton, racquetball, tennis, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 234. Strength Training: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 114, 134, 154, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various types of strength training (e.g., body building, power lifting, weight training, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 235. Target Sports: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 115, 135, 155, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various target sports (e.g., trapshooting, skeet, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 236. Team Sports: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 116, 136, 156, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 237. Gymnastics: Movement Performance and Analysis (MP&A). 1 Credit.
Course may be repeated as long as content varies, to a maximum of 12 credits for the KIN 220-239 series. Prerequisite: matching KIN 117, 137, 157, or performance equivalent in same are. These courses focus on the development of performance, performance analysis and knowledge in various types of gymnastics (e.g., artistic, trampolining, tumbling, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes. F.S.SS.

KIN 240. Introduction to Wellness. 2 Credits.
Designed to encourage personal awareness and responsibility for the maintenance of health and well-being. This course will study the multidimensional nature of wellness and the pivotal role that each dimension plays in personal self-fulfillment. F.S.

KIN 241. Introduction to Coaching. 1 Credit.
An introduction and overview of relevant philosophy, sport psychology, sport pedagogy, sport physiology, sport medicine and sport management issues confronting coaches. Coaching is presented with emphasis on effective instructional techniques and coaching principles based upon scientific knowledge. F.S.

KIN 242. Introduction to Kinesiology. 2 Credits.
An introduction and overview of are as in Kinesiology. Includes information on the required preparation and training for careers in this area. On demand.

KIN 276. Motor Learning. 2 Credits.
Consideration of various factors which may affect learning and performance in human movement activities. Prerequisite: KIN majors only or consent of instructor. Corequisite: KIN 276L. S.

KIN 276L. Motor Learning Lab. 1 Credit.
Demonstration of various factors which may affect learning and performance in human movement activities. Prerequisite: KIN major only or consent of the instructor. Corequisite: KIN 276. S.

KIN 290. Physical Education Activities for the Elementary Grades. 3 Credits.
Study of physical activities in modern physical education programs for grades K-6. Emphasis on skill themes and developmentally appropriate activities. F.

KIN 299. Special Topics in Kinesiology. 1-4 Credits.
Specialized topics related to Kinesiology. Repeatable to 9 credits. Repeatable to 9 credits. On demand.

KIN 305. Health/Physical Education for Early Childhood and Elementary Education Teachers. 3 Credits.
This course provides background information and skills for the early childhood and elementary teacher to implement coordinated health education in the elementary grades and how to provide support and effective instruction in elementary physical education. Prerequisite: Admission to the Teacher Education program. F.S.SS.

KIN 309. Water Safety Instruction. 2 Credits.
Scientific movement principles, theories and techniques as they apply to the teaching and conduct of aquatic activities. Laboratory teaching assignments. Prerequisite: Current Senior Lifesaving Certificate. On demand.

KIN 325. Youth and Children in Sport. 3 Credits.
Analysis of research findings in physical education, exercise science and wellness with applications to coaching children and youth in sport. F.
KIN 326. Fundamentals of Physical Conditioning. 3 Credits.  
A study of the basic knowledge, principles, and methods of physical conditioning for health, fitness and wellness benefits, and for athletic performance improvement. Prerequisite: KIN Majors only or consent of instructor. F.S.

KIN 327. Fitness for Life. 3 Credits.  
A classroom course focusing on advanced concepts of lifetime fitness and wellness from a consumer perspective. Emphasis is on the development of personal programs for fitness and wellness. F.S.

KIN 332. Biomechanics. 3 Credits.  
The study of human movement with special emphasis on those movements related to sport and physical activity. Prerequisites: KIN or Athletic Training majors only, or consent of instructor; ANAT 204, ANAT 204L. Corequisite: KIN 323L. F.

KIN 332L. Biomechanics Laboratory. 1 Credit.  
The demonstration of biomechanical principles related to movement in sport and physical activity. Prerequisites: KIN or Athletic Training Majors only, or consent of instructor; ANAT 204 and 204L. Corequisite: KIN 332. F.

KIN 341. Organization and Administration of Athletics. 2 Credits.  
Principles and practices for management of the interscholastic athletic program. Prerequisite: Athletic Coaching minors only. S.

KIN 355. Applied Motor Development. 3 Credits.  
Changes in motor performance which occur with age; physical and mental development as they relate to these changes. Prerequisite: KIN Majors only or consent of instructor. S.

KIN 375. Fundamentals of Group Exercise Instruction. 3 Credits.  
Fundamental knowledge and practical skills needed to lead a group exercise class. Prerequisite: KIN 326. On demand.

KIN 376. Professional Skills in Personal Training. 3 Credits.  
The fundamental knowledge and skills necessary to provide personal training for individuals and/or small groups. Prerequisite: KIN 326. On demand.

KIN 390. Introduction to Teaching in Physical Education and Coaching. 2 Credits.  
Strategy for classroom management, planning, instruction, and assessment of teacher and student behavior. Special emphasis on systematic development of a variety of teaching skills through practice and feedback in individual and small group situations. Prerequisites: KIN 220-239 series requirements. Corequisite: KIN 390L. On demand.

KIN 390L. Introduction to Teaching in Physical Education and Coaching Laboratory. 2 Credits.  

KIN 397. Cooperative Education. 1-4 Credits.  
Part of the educational system where KIN majors can earn academic credit for career work done in their field of study. Arranged by mutual agreement among student, department, and employer. Repeatable to 16 credits. Prerequisite: KIN majors only. Repeatable to 16 credits. S/U grading. F.S,SS.

KIN 400. Methods and Materials for Teaching Physical Education Elementary School. 2 Credits.  
The development of skills and knowledge related to teaching physical education to young children. Prerequisites: KIN 290, KIN 390L and admission to Teacher Education. Corequisite: KIN 400L. On demand.

KIN 400L. Methods and Materials for Teaching Physical Education in the Elementary School-Laboratory. 2 Credits.  
Supervised experiences in the secondary school for the purpose of developing teaching skills for physical education and sport settings. Prerequisites: KIN 290, 390L and admission to Teacher Education. Corequisite: KIN 400. On demand.

KIN 401. Sport Sociology. 3 Credits.  
The critical exploration of the function of sports in American culture, in an interdisciplinary fashion, with a focus on the contemporary scene. F.S,SS.

KIN 402. Exercise Physiology. 3 Credits.  
The acute and chronic effect of the type, intensity and duration of exercise on physiological functions. Prerequisites: KIN or Athletic Training majors only, or consent of instructor; PPT 301 or Human Physiology equivalent. Corequisite: KIN 402L. F.

KIN 402L. Exercise Physiology Laboratory. 1 Credit.  
The demonstration and measurement of the acute effects of exercise on physiological functions. Prerequisites: KIN or Athletic Training majors only, or consent of instructor; PPT 301 or Human Physiology equivalent. Corequisite: KIN 402. F.

KIN 403. School Health Education. 2 Credits.  
Provides prospective health educators with a cursory look at health curriculum construction and investigation of different methods, devices and classroom techniques. Prerequisite: KIN majors only. S.

KIN 404. Adapted Physical Activity. 3 Credits.  
A study of the physical and motor characteristics and needs of persons of all ages with disabilities, with application to the planning and implementation of physical activity programs. Prerequisite: KIN majors only or consent of instructor. S.

KIN 410. Methods and Materials for Teaching Physical and Health Education in the Secondary School. 3 Credits.  
Instructional skills and curriculum analysis for secondary school physical and health education. Prerequisites: KIN 400 and admission to Teacher Education. Corequisite: KIN 410L. F.

KIN 410L. Methods and Materials for Teaching Physical & Health Education in the Secondary School-Laboratory. 1 Credit.  
Supervised experiences in the secondary school for the purpose of developing teaching skills for physical and health education. Prerequisite: KIN 400L and admission to Teacher Education. Corequisite: KIN 410. F.

KIN 420. Curriculum Development for Physical and Health Education. 3 Credits.  
An examination of different curriculum models used in K-12 physical education programs as well as health education programs. Also, study of national and state standards, program development and assessment, and future trends in school physical education. Prerequisites: KIN 390/390L, admission to Teacher Education. S.

KIN 424. Aquatics: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 224 in the same area. These courses focus on methods employed in coaching specific aquatics-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F.S,SS.

KIN 425. Combative Sports: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 225 in the same area. These courses focus on methods employed in coaching specific combative sports (e.g., boxing, kickboxing, etc.). For specific course content, see the current schedule of classes. F.S,SS.

KIN 427. Dance: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 227 in the same area. These courses focus on methods employed in coaching specific dance types (e.g., ballet, hip-hop, etc.). For specific course content, see the current schedule of classes. F.S,SS.

KIN 428. Fitness and Conditioning: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 228 in the same area. These courses focus on methods employed in coaching specific fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). For specific course content, see the current schedule of classes. F.S,SS.

KIN 431. Individual Sports/Activities: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 231 in the same area. These courses focus on methods employed in coaching specific individual sports and activities (e.g., golf, ice skating, track and field events, etc.). For specific course content, see the current schedule of classes. F.S,SS.

KIN 432. Individual Sports/Activities: Coaching Methods. 2 Credits.  
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 232 in the same area. These courses focus on methods employed in coaching specific outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). For specific course content, see the current schedule of classes. F.S,SS.
KIN 433. Racquet Sports: Coaching Methods. 2 Credits.
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 233 in the same area. These courses focus on methods employed in coaching specific racquet sports (e.g., badminton, racquetball, tennis, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 434. Strength Training: Coaching Methods. 2 Credits.
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 234 in the same area. These courses focus on methods employed in coaching specific types of strength training (e.g., body building, power lifting, weight training, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 435. Target Sports: Coaching Methods. 2 Credits.
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 235 in the same area. These courses focus on methods employed in coaching specific target sports (e.g., trapshooting, skeet, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 436. Team Sports: Coaching Methods. 2 Credits.
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 236 in the same area. These courses focus on methods employed in coaching specific team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 437. Gymnastics: Coaching Methods. 2 Credits.
Repeatable with different sports to a maximum of 10 credits in the KIN 420-439 series. Prerequisite: matching KIN 237 in the same area. These courses focus on methods employed in coaching specific types of gymnastics (e.g., artistic, trampoline, tumbling, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 440. Sport Psychology. 3 Credits.
Examination of psychological constructs influencing sport and exercise. F,S,SS.

KIN 446. Exercise Testing and Prescription. 3 Credits.
Theory and practice of administering exercise, fitness and wellness tests, and using the results in exercise prescription and programming. Prerequisites: KIN 326 and KIN 402. On demand.

KIN 491. Senior Capstone. 3 Credits.
A critical analysis of problems, professional obligations and careers in teaching physical education. Corequisite: T&L 487. F,S.

KIN 494. Directed Studies/Research in KIN. 1-4 Credits.
An in-depth study or participation in a research project in a subject area selected by the student under faculty supervision. Repeatable to 8 credits. Prerequisite: Consent of instructor. Repeatable to 9 credits. F,S,SS.

KIN 495. Service Learning in KIN. 2 Credits.
Independent and group study of professional placement and leadership in kinesiology settings. Practical experiences in these settings within the community. Includes lectures, site visits, and fieldwork hours. Prerequisite: Instructor consent. F,S,SS.

KIN 496. Field Study in KIN. 1-6 Credits.
Placement of student in a practical setting under university faculty supervision. Repeatable to 8 credits. Prerequisites: Consent of instructor and upper division status. Repeatable to 8 credits. F,S,SS.

KIN 497. Internship in KIN. 10 Credits.
Development of professional skills through practical experience in agencies such as hospitals, physical therapy clinics, retirement or convalescent centers, work site wellness programs, fitness facilitation, on-campus fitness programs and community sports organizations under the supervision of professionals and faculty. Credits are taken during one semester for paid or volunteer work. Prerequisites: KIN majors only, consent of instructor, upper division status, and current First Aid/CPR certification. S/U grading. F,S,SS.

KIN 498. Practicum in Coaching. 2 Credits.
Supervised experiences in a school setting for the purpose of developing skills and techniques for coaching. Prerequisites: KIN 420-KIN 439 in the assigned sport in which the student will coach. F,S,SS.

KIN 499. Special Topics in KIN. 1-4 Credits.
Investigation of special topics in the study of physical education, exercise science and wellness not included in current departmental course offerings. Repeatable to 4 credits. Prerequisites: KIN majors only and consent of instructor. Repeatable to 4 credits. F,S,SS.

PHE Courses

PHE 101. Introduction to Public Health. 3 Credits.
Introduction to the population health approach to public health. Principles of evidence-based public health and tools for implementation including health communications and informatics, applications of social and behavioral sciences, and health policy, law and ethics. Methods for addressing non-communicable diseases, communicable disease and environmental diseases and injury. An overview of the U.S. health care system and comparisons with health care systems in other developed countries. Examination of public health institutions and systems at the local/state, federal and global levels as well as future issue in public health. F,S.

PHE 102. Epidemiology in Public Health. 3 Credits.
This course covers applications of epidemiologic methods and procedures to the study of the distribution and factors influencing health and diseases, morbidity, injuries, disability, and mortality in populations. Epidemiologic methods for the control of conditions such as infectious and chronic diseases, mental disorders, community and environmental health hazards, and unintentional injuries are discussed. Other topics include qualitative aspects of epidemiology, for example, data sources, measures of morbidity and mortality, evaluation of association and causality, and study design. F,S.

PHE 103. Introduction to Global Health. 3 Credits.
The purpose of this course is to provide the students with the basic knowledge of health indicators, major determinants, and trends of global health. F.

PHE 301. Principles and Foundation of Health Education. 3 Credits.
The purpose of this course is to provide the students the historical perspectives of health and health education; professional issues and ethics; credentialing; principles, practices, theoretical frameworks, and foundations of health education. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. F.

PHE 302. Community Health. 3 Credits.
Concepts of community and public health, health advocacy, and cultural competence; role of government, nonprofit and private agencies; investigation of health issues. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. F.

PHE 303. Organization and Administration of Community Health Programs. 3 Credits.
The purpose of this course is to provide the students with the basic principles of the organization and administration of health programs: leadership skills; grant writing. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. S.

PHE 304. Health Program Planning and Implementation. 3 Credits.
Application of processes of program development in designing health education/health promotion programs. Prerequisites: Public Health Education Major, PHE 101, PHE 102, and PHE 301. SS, even years.

PHE 305. Program Evaluation and Research Design. 3 Credits.
Basics of health education program evaluation, including formative, summative, process, impact, and outcome evaluation. Research design and applied methods in program evaluation. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. S.

PHE 306. Epidemiology and Biostatistics. 3 Credits.
An introduction to epidemiology and biostatistics in public health. Prerequisites: Public Health Education Major, PHE 101, PHE 102 and MATH 103. S.

PHE 307. Methods and Materials of Health Education. 3 Credits.
Principles and application of methodology for educating about health; learning styles; development of computer-generated learning materials; selection, utilization, and evaluation of resources. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. S.

PHE 415. Public Health Internship. 15 Credits.
A supervised practical experience designed to provide the student the opportunity to apply the knowledge and skills learned through their public health coursework. Prerequisites: Public Health Education major, PHE 301, PHE 302, PHE 303, PHE 304, PHE 305, PHE 306, and PHE 307. S/U grading. SS.
I. Essential Studies Requirements (see University ES listing).

II. Major Curriculum Listed Under Specific Language.

B.A. with a Major in Language

Teacher Certification

Through a partnership with the College of Education and Human Development and the Department of Teaching and Learning, students may seek teacher licensure in a language. The following program of study must be completed:

I. Requirements for the B.A. with a major in a Language.

II. Humanities requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HIST 101</td>
<td>Western Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 102</td>
<td>Western Civilization II</td>
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III. Additional requirements for licensure in French, German or Spanish

Online tests in Phonetics (with grade no lower than B) and Advanced Grammar (with grade no lower than B):

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 432</td>
<td>Learning Environments</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
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IV. Admission to the Teacher Education program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 615) for admission and licensing requirements.)

V. The program in Secondary Education, to include:

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<tr>
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<tbody>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
<td>3</td>
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<tr>
<td>T&amp;L 386</td>
<td>Field Experience</td>
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<tr>
<td>LANG 400</td>
<td>Methods and Materials of Teaching Middle and Secondary School Foreign Language</td>
<td>3</td>
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<tr>
<td>T&amp;L 432</td>
<td>Learning Environments</td>
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<td>T&amp;L 433</td>
<td>Multicultural Education</td>
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<td>T&amp;L 486</td>
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<td>T&amp;L 487</td>
<td>Student Teaching **</td>
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<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
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* T&L 390 Special Topics, may be taken as an elective (supervised by Languages Department Faculty)

** A full semester of student teaching, normally taken during the semester of graduation

Language majors seeking teacher licensure must have an adviser in both the Languages Department and the Department of Teaching and Learning.

Chinese Studies

B.A. with a Major in Chinese Studies

Required: 40 credits distributed between Parts A and B as follows:

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<td>4</td>
</tr>
<tr>
<td>CHIN 102</td>
<td>First Year Chinese II</td>
<td>4</td>
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<tr>
<td>CHIN 201</td>
<td>Second Year Chinese I</td>
<td>4</td>
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<tr>
<td>CHIN 202</td>
<td>Second Year Chinese II</td>
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<tr>
<td>LANG 380</td>
<td>Global Gateways</td>
<td>3</td>
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<tr>
<td>LANG 480</td>
<td>Capstone: Global Connections</td>
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</table>

B.A. with a Major in a Language

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4 year institution) including:

Part B: Study or internship in China/area studies (18 credits)
Select six of the following: 18
CHIN 303 Chinese Overseas Immersion
CHIN 305 Chinese Culture Through Films
CHIN 306 Introduction to Chinese Calligraphy
CHIN 312 Topics in Chinese Culture
CHIN 405 Traditional Chinese Literature in Translation
CHIN 406 Modern Chinese Literature in Translation
HIST 362 Modern China
RELS 315 Daoism and Confucianism
RELS 380 Buddhism
PHIL 383 Asian Philosophy
GEOG 463 Regional Geography (China)
BADM 316 Introduction to Business in China
BADM 318 China Then and Now
BADM 319 Business Fieldwork in Shanghai
BADM 497 Internship in China (S/U only)

Other courses may be substituted with the consent of the Chinese Studies academic advisor.

Classical Studies

B.A. with a Major in Classical Studies
Required: 43 credits distributed among Parts A (16 credits), B (21 credits) and C (6 credits):

I. Essential Studies Requirements (see University ES listing).

Part A: Language requirement

Option 1, Latin
CLAS 101 First Year Latin I 4
CLAS 102 First Year Latin II 4
CLAS 201 Second Year Latin I 4
CLAS 202 Second Year Latin II 4

Option 2, Greek
CLAS 151 First Year Greek I 4
CLAS 152 First Year Greek II 4
CLAS 251 Second Year Greek I 4
CLAS 252 Second Year Greek II 4

Option 3, Greek and Latin
CLAS 101 First Year Latin I 4
CLAS 102 First Year Latin II 4
CLAS 151 First Year Greek I 4
CLAS 152 First Year Greek II 4

Part B: Courses in classical civilization, literature, culture
Select seven of the following: 21
CLAS 185 Introduction to Classical Mythology
CLAS 211 Masterpieces Greek and Roman Literature in Translation
CLAS 262 Greek and Roman Epic in Translation
CLAS 301 Latin Prose
CLAS 311 Ancient Greek Theater
CLAS 364 Special Topics in Classical Literature
CLAS 404 Latin Poetry
HIST 101 Western Civilization I
HIST 301 Medieval Civilization
HIST 343 Ancient Greece
HIST 344 Ancient Rome
HIST 345 The Ancient Near East
HUM 102 The Human Community
PHIL 300 Ancient Philosophy
PHIL 301 Medieval Philosophy

Part C: Language requirement

POLS 310 Introduction to Political Thought
RELS 231 Christian Scripture/New Testament
RELS 328 Development of Christian Doctrine

Additional 100- and 200-level Latin courses, other than those used to satisfy Part A:
Additional 100- and 200-level Greek courses, other than those used to satisfy Part A:
Other courses as approved by Classical Studies adviser

French

The French program offers a wide range of courses emphasizing language acquisition and an understanding of international cultural diversity. To achieve these goals, students learn to communicate in French and to address issues of cultural diversity as drawn from literature, film, and other forms of contemporary media from the cultural production of the more than 50 French-language countries of the world. The program offers upper-division courses in the following categories: the study and practice of spoken and written French in national and international contexts, an interdisciplinary approach to the study of Francophone literatures and films, and the understanding and analysis of Francophone perspectives regarding socio-cultural contemporary world issues.

A B.A. with a major in French includes four introductory lower-division courses and a minimum of 24 credits at the 300 and 400 levels. Students are required to take a minimum of two 300/400 level courses in each of the categories below as well as LANG 380 and LANG 480.

lower division courses
FREN 101 First Year French I 4
FREN 102 First Year French II 4
FREN 201 Second Year French I 4
FREN 202 Second Year French II 4

The program offers upper-division courses in the following categories:

Category 1: the study and practice of spoken and written French in national and international contexts
FREN 301 Third Year French I 3
FREN 302 Third Year French II 3
FREN 305 French Conversation and Culture 3
FREN 306 French Conversation and Culture II 3
FREN 307 A Social and Cultural History of Québec 3
FREN 340 Business French 3
LANG 318 Individual Arranged Study Abroad 1-12
LANG 319 University Sponsored Study Abroad 1-12
FREN 413 Advanced French Grammar Review 3
FREN 494 Individual French Readings 1-3

Category 2: an interdisciplinary approach to the study of Francophone literatures and films
FREN 301 Third Year French I 3
FREN 302 Third Year French II 3
FREN 307 A Social and Cultural History of Québec 3
LANG 318 Individual Arranged Study Abroad 1-12
LANG 319 University Sponsored Study Abroad 1-12
FREN 371 Studies in European Francophone Literatures, Films and Cultures 3
FREN 372 Studies in African, Asian, Caribbean, and/or Polynesian Francophone Literatures, Films and Cultures 3
German Studies

A major in German Studies consists of:

Four introductory lower-division courses
- GERM 101 First Year German I 4
- GERM 102 First Year German II 4
- GERM 201 Second Year German I 4
- GERM 202 Second Year German II 4

27 total credits required

12 must come from the following:
- GERM 307 Communicating Cultures I 3
- GERM 308 Communicating Cultures II 3
- LANG 380 Global Gateways 3
- LANG 480 Capstone: Global Connections 3

15 elective credits from the following:
- GERM 304 German Phonetics: History, Dialect, and the Living Language 3
- GERM 310 Screening German Cultures 3
- GERM 404 German Stories, German Histories 3
- GERM 405 Mediating Cultures: Social Discourse in German-Speaking Countries 3
- GERM 409 Madness and Genius: An Introduction to German Intellectual History 3
- GERM 413 Advanced German Grammar Review 3
- LANG 318 Individual Arranged Study Abroad 1-12
- LANG 319 University Sponsored Study Abroad 1-12

Outside of LANG 380 Global Gateways and LANG 480 Capstone: Global Connections, only 3 credits from GERM coursework can be taught in English.

Spanish

A major in Spanish consists of:

Four introductory lower division courses
- SPAN 101 First Year Spanish I 4
- SPAN 102 First Year Spanish II 4
- SPAN 201 Second Year Spanish I 4
- SPAN 202 Second Year Spanish II 4

Upper division courses (27 credits)
- SPAN 308 Spanish Conversation 3
- SPAN 309 Spanish Composition 3
- SPAN 462 Seminar in Hispanic Literature, Culture and Linguistics 3
- LANG 380 Global Gateways 3
- LANG 480 Capstone: Global Connections 3

Select 3 credits from the following:
- SPAN 304 Spanish Phonetics 3
- SPAN 450 Advanced Spanish Grammar 3
- SPAN 420 Early Spanish Literature & Culture 3
- SPAN 421 Modern & Contemporary Spanish Literature & Culture 3
- SPAN 422 Early Latin American Literature & Culture 3
- SPAN 423 Modern & Contemporary Latin American Literature & Culture 3

Select 6 credits from the following:

Elective: Select 3 credits from SPAN 300/400 level courses as an elective or choose from the list below. Note that courses are not repeatable unless topics vary.

Spanish

A major in Spanish with an emphasis in teaching consists of:

Four introductory lower division courses
- SPAN 101 First Year Spanish I 4
- SPAN 102 First Year Spanish II 4

Norwegian

A major in Norwegian includes four introductory courses (NORW 101, 102, 201, 202) and a minimum of 24 credit hours of upper-division courses. Credits for the major can be selected from the following upper-division courses: NORW 350, 403, 431, 432, 433, 434; 6 of the 24 credits must consist of LANG 380 and the departmental capstone, LANG 480. With departmental approval, NORW 494 and LANG 318 and 319 may also count toward the major.

Four introductory courses
- NORW 101 First Year Norwegian I 4
- NORW 102 First Year Norwegian II 4
- NORW 201 Second Year Norwegian I 4
- NORW 202 Second Year Norwegian II 4

Upper division courses (minimum 24 credit hours)
- NORW 350 Norwegian Culture 3
- NORW 403 Great Literary Works of Norway 3
- NORW 431 Advanced Norwegian 3
- NORW 432 Advanced Norwegian 3
- NORW 433 Norwegian Literature 3
- NORW 434 Norwegian Literature 3
- LANG 380 Global Gateways (Required) 3
- LANG 480 Capstone: Global Connections (Required) 3

With departmental approval the following may count towards the major:
- LANG 318 Individual Arranged Study Abroad 1-12
- LANG 319 University Sponsored Study Abroad 1-12
- NORW 494 Individual Norwegian Readings 1-3

Outside of LANG 380 Global Gateways and LANG 480 Capstone: Global Connections, only 3 credits from GERM coursework can be taught in English.

Majors and minors are encouraged to make their interests known early in their academic career, including the desire to study in a German-speaking country, particularly for programs administered through partner institutions. In addition to the department-wide Arneberg and Larsen scholarships, the German Program, awards the Max Kade, Stoltz and Rogers scholarships as well as the Boswau Endowment Fund exclusively to qualified students of German.
SPAN 201  Second Year Spanish I  4
SPAN 202  Second Year Spanish II  4

Upper division courses (27 credits)
SPAN 304  Spanish Phonetics  3
SPAN 308  Spanish Conversation  3
SPAN 309  Spanish Composition  3
SPAN 450  Advanced Spanish Grammar  3
SPAN 462  Seminar in Hispanic Literature, Culture and Linguistics  3

Select 6 credits from the following:
SPAN 420  Early Spanish Literature & Culture  3
SPAN 421  Modern & Contemporary Spanish Literature & Culture  3
SPAN 422  Early Latin American Literature & Culture  3
SPAN 423  Modern & Contemporary Latin American Literature & Culture  3

Minor in a Language
I. Minor curriculum listed under specific language.

Minor in Chinese Studies: Language and Culture
Required: 23 credits distributed between Parts A and B as follows:

Part A: Language Requirements
CHIN 101  First Year Chinese I  4
CHIN 102  First Year Chinese II  4

Part B: Area Studies
Select five of the following:  15
CHIN 201  Second Year Chinese I  4
CHIN 202  Second Year Chinese II  4
CHIN 303  Chinese Overseas Immersion  4
CHIN 305  Chinese Culture Through Films  4
CHIN 306  Introduction to Chinese Calligraphy  4
CHIN 312  Topics in Chinese Culture  4
CHIN 405  Traditional Chinese Literature in Translation  4
CHIN 406  Modern Chinese Literature in Translation  4
HIST 362  Modern China  4
RELS 315  Daoism and Confucianism  4
RELS 380  Buddhism  4
PHIL 383  Asian Philosophy  4
GEOG 463  Regional Geography (China)  4

Total Credits  23

Other courses may be substituted with the consent of the Chinese Studies academic advisor.

Minor in Classical Studies
Required: 28 credits distributed between Parts A and B as follows:

Part A: Language requirement **
Option 1, Latin
CLAS 101  First Year Latin I  4
CLAS 102  First Year Latin II  4
CLAS 201  Second Year Latin I  4
CLAS 202  Second Year Latin II  4

Option 2, Greek
CLAS 151  First Year Greek I  4
CLAS 152  First Year Greek II  4
CLAS 251  Second Year Greek I  4
CLAS 252  Second Year Greek II  4

Option 3, Greek and Latin
CLAS 101  First Year Latin I  4
CLAS 102  First Year Latin II  4
CLAS 151  First Year Greek I  4
CLAS 152  First Year Greek II  4

Part B
Select four of the following:  12
CLAS 185  Introduction to Classical Mythology  4
CLAS 211  Masterpieces Greek and Roman Literature in Translation  4
CLAS 262  Greek and Roman Epic in Translation  4
CLAS 301  Latin Prose  4
CLAS 311  Ancient Greek Theater  4
CLAS 364  Special Topics in Classical Literature  4
CLAS 404  Latin Poetry  4
HIST 101  Western Civilization I  4
HIST 301  Medieval Civilization  4
HIST 343  Ancient Greece  4
HIST 344  Ancient Rome  4
HIST 345  The Ancient Near East  4
HUM 102  The Human Community  4
CHIN 480  Capstone: Global Connections  4
PHIL 300  Ancient Philosophy  4
PHIL 301  Medieval Philosophy  4
RELS 231  Christian Scripture/New Testament  4
RELS 328  Development of Christian Doctrine  4
Additional 100- and 200-level Latin courses, other than those used to satisfy Part A **
Additional 100- and 200-level Greek courses, other than those used to satisfy Part A **
Other courses as approved by Classical Studies advisor ***

** i.e., a student may not use the same courses to satisfy Part A and Part B.
*** 9 of these credits must be at the Upper Division level (300 or above).

Minor in French
A minor in French includes four introductory lower-division courses and a minimum of 15 credits at the 300 and 400 levels.

FREN 101  First Year French I  4
FREN 102  First Year French II  4
FREN 201  Second Year French I  4
FREN 202  Second Year French II  4

Students are required to take a minimum of one 300/400 level course in each of the categories. The capstone course may be used to fulfill the minor but is not required. The majority of 300/400 level courses have the potential to fulfill more than one category. Therefore, once a course has been designated, either by the student or the advisor, as fulfilling the requirements in one category, it may not also be used to fulfill the requirements of a second category.

Students are encouraged to participate in programs of travel and study in one or more French speaking countries. Credits earned on such programs may be counted toward a major or a minor in French. However, all majors and minors are required to take on campus a minimum of one course in each of the three areas (see above), regardless of the number of credits acquired through transfer, including study abroad.

German
A minor in German consists of:

Four introductory lower-division courses
GERM 101  First Year German I  4
GERM 102  First Year German II  4
German Phonetics: History, Dialect, and the Living Language
GERM 404 German Stories, German Histories
GERM 409 Madness and Genius: An Introduction to German Intellectual History
GERM 413 Advanced German Grammar Review
LANG 318 Individual Arranged Study Abroad
LANG 319 University Sponsored Study Abroad

A maximum of one English-language course (GERM 206 Germany in a Global World, GERM 306 Contextualizing Culture: Introduction to German Studies or GERM 406 Literary Voices in Translation) may count toward the minor.

Norwegian

A minor in Norwegian includes:

Four introductory courses
NORW 101 First Year Norwegian I
NORW 102 First Year Norwegian II
NORW 201 Second Year Norwegian I
NORW 202 Second Year Norwegian II

Upper division courses (minimum 12 credit hours)
NORW 350 Norwegian Culture
NORW 403 Great Literary Works of Norway
NORW 431 Advanced Norwegian
NORW 432 Advanced Norwegian
NORW 433 Norwegian Literature
NORW 434 Norwegian Literature

With departmental approval, NORW 494 Individual Norwegian Readings and LANG 318 Individual Arranged Study Abroad, LANG 319 University Sponsored Study Abroad and LANG 480 Capstone: Global Connections may also count toward the minor.

Spanish

A minor in Spanish includes 12 upper division credits beyond the four introductory lower division courses:

Four introductory lower division courses
SPAN 101 First Year Spanish I
SPAN 102 First Year Spanish II
SPAN 201 Second Year Spanish I
SPAN 202 Second Year Spanish II

Required upper division courses (9 credits)
SPAN 308 Spanish Conversation
SPAN 309 Spanish Composition
SPAN 462 Seminar in Hispanic Literature, Culture and Linguistics

One elective from the following (3 credits)
SPAN 304 Spanish Phonetics
SPAN 420 Early Spanish Literature & Culture
SPAN 421 Modern & Contemporary Spanish Literature & Culture
SPAN 422 Early Latin American Literature & Culture

Spanish Composition
SPAN 423 Modern & Contemporary Latin American Literature & Culture
SPAN 450 Advanced Spanish Grammar

Chin Courses

CHIN 101. First Year Chinese I. 4 Credits.
Fundamentals of Chinese grammar, oral use of the language and reading of easy Chinese. F.

CHIN 102. First Year Chinese II. 4 Credits.
Continued study of fundamentals of Chinese grammar, oral use of the language and reading of easy Chinese. Prerequisite: CHIN 101 with a grade of C or better. S.

CHIN 201. Second Year Chinese I. 4 Credits.
Bring students' Chinese proficiency to the intermediate level through intensive training in reading, writing, listening and speaking. Prerequisite: CHIN 102 or an equivalent approved by the department. F.

CHIN 202. Second Year Chinese II. 4 Credits.
Bring students' Chinese proficiency to the intermediate level through intensive training in reading, writing, listening and speaking. Prerequisite: CHIN 201 or an equivalent approved by the department. S.

CHIN 303. Chinese Overseas Immersion. 3-12 Credits.
This course, offered in China/Taiwan allows further improvement in Chinese language proficiency and significant understanding of Chinese culture through coursework and first-hand experience. Repeatable to 24 credits. Repeatable to 24 credits. F.S.

CHIN 305. Chinese Culture Through Films. 3 Credits.
Help students understand traditional and modern Chinese cultural values through examining films and readings. F.

CHIN 306. Introduction to Chinese Calligraphy. 3 Credits.
Provide students significant exposure to Chinese culture through appreciation of a variety of script styles and practice in Kaishu "block." S.

CHIN 312. Topics in Chinese Culture. 3 Credits.
Introduction to various aspects of Chinese culture. Repeatable to 9 credits when topics vary. Repeatable to 9 credits. On demand.

CHIN 405. Traditional Chinese Literature in Translation. 3 Credits.
Introduction to genres and topics in Chinese literature, and significant pre-1911 Chinese works. Repeatable to 9 credits when topics vary. Repeatable to 9 credits. F, even years.

CHIN 406. Modern Chinese Literature in Translation. 3 Credits.
Introduction to genres and topics in Chinese literature, and significant post-1911 Chinese writers and their works. Repeatable to 9 credits when topics vary. Repeatable to 9 credits. S, odd years.

CHIN 498. Senior Project. 1 Credit.
A capstone project designed by students, in consultation with their advisor, which reflects an integrated knowledge of various aspects of Chinese culture. Prerequisites: Senior standing and completion of coursework for Chinese Studies major or consent of Chinese Studies advisor. S/U grading. F,S,SS.

Clas Courses

CLAS 101. First Year Latin I. 4 Credits.
Introduction to Latin grammar and syntax, with selected readings from ancient authors. F.

CLAS 102. First Year Latin II. 4 Credits.
Continued study of Latin grammar and syntax, with selected readings from ancient authors. Prerequisite: CLAS 101 with a grade of a C or better. S.

CLAS 151. First Year Greek I. 4 Credits.
Introduction to ancient Greek grammar and syntax, with selected readings from ancient authors. On demand.

CLAS 152. First Year Greek II. 4 Credits.
Continued study of ancient Greek grammar and syntax, with selected readings from ancient authors. Grade of "C" or better in CLAS 151 recommended. Prerequisite: CLAS 151 with a grade of a C or better. On demand.

CLAS 185. Introduction to Classical Mythology. 3 Credits.
Study of literary and artistic representations of Greek and Roman mythology. Different methods of interpreting myths will also be explored. These include anthropological, philosophical and psychological approaches. On demand.
CLAS 201. Second Year Latin I. 4 Credits.
Conclusion of basic grammar and introduction to Latin authors, such as Cicero, Nepos, Petronius, or Phaedrus. Prerequisite: CLAS 102 or an equivalent approved by the department. F.

CLAS 202. Second Year Latin II. 4 Credits.
Readings in Latin literature such as the works of Catullus, Ovid, or Vergil. Prerequisite: CLAS 201 or an equivalent approved by the department. S.

CLAS 211. Masterpieces Greek and Roman Literature in Translation. 3 Credits.
This course will introduce students to a wide range of classical literature from ancient Greece and Rome. We will survey major authors from the following genres: epic, lyric, tragedy, comedy, history, philosophy, and oratory. These works will provide a window to Greek and Roman history, culture, and society. In our engagement with these texts we will attempt to understand them both in their own times and in our era, where they have long been fundamental to liberal studies. All readings are in English translation. On demand.

CLAS 251. Second Year Greek I. 4 Credits.
Conclusion of basic grammar and introduction to ancient Greek authors, such as Plato, Lysias, Xenophon, or Euripides. Prerequisite: CLAS 152 or an equivalent approved by the department. On demand.

CLAS 252. Second Year Greek II. 4 Credits.
Selected readings from works of ancient Greek literature, such as Homer’s Iliad or Plato’s Ion. May be repeated, with permission of the instructor, up to eight credits. Prerequisite: CLAS 251 or an equivalent approved by the department. Repeatable to 8 credits. On demand.

CLAS 262. Greek and Roman Epic in Translation. 3 Credits.
The ancient Greek and Roman tradition of epic poetry preserves some of the earliest, most influential examples of Western literature. This course examines the development of the Greco-Roman epic genre in the context of the political and social world of the Mediterranean region from its origins in oral performance traditions in the Bronze Age to the Roman Imperial period. Readings will focus on Homeric and Hesiodic poetry, Apollonius’ Hellenistic epic Argonautica, and the Roman epics of Virgil and Ovid. All readings are in English. On demand.

CLAS 301. Latin Prose. 3 Credits.
Readings from major prose authors, such as Apuleius, Cicero, Sallust, Seneca, Livy, Petronius or Tacitus. Prerequisite: CLAS 202 or an equivalent approved by the department. Repeatable to 9 credits. On demand.

CLAS 311. Ancient Greek Theater. 3 Credits.
The playwrights fifth-century BCE Athens composed dramas whose beauty, elegance, and potency have endured into the twenty-first century. This course surveys the remaining works of the four greatest Athenian playwrights- the tragedians Aeschylus, Sophocles, and Euripides, and the comedian Aristophanes- in an effort to discover the mysteries and the continuing appeal of ancient Greek theater. Students will approach the plays from different perspectives and contexts-mythological, historical, cultural, theatrical, and more- in order to understand how they functions both as myth and as social commentary. All readings are in English. On demand.

CLAS 364. Special Topics in Classical Literature. 3 Credits.
Study of a specific author, genre (e.g. epic, tragedy, comedy), or special theme (e.g., war, the perception of women) in Greek and/or Latin literature. May be repeated, with change of topic, up to 9 hours. Repeatable to 9 credits. On demand.

CLAS 404. Latin Poetry. 3 Credits.
Readings from major Latin poets such as Vergil, Horace, Catullus, Ovid, Juvenal, Martial, Plautus or Terence. Repeatable to 9 credits. Prerequisite: CLAS 202 or an equivalent approved by the department. Repeatable to 9 credits. On demand.

CLAS 491. Seminar in Latin Literature. 3 Credits.
Close translation and critical analysis of a major work of Latin literature. Students will be encouraged to pursue their own topics of interest and to develop those topics into an oral presentation and/or paper. Repeatable to 6 credits. Prerequisite: CLAS 202 or an equivalent approved by the department. Repeatable to 6 credits. On demand.

CLAS 494. Individual Greek and Latin Readings. 1-4 Credits.
Topic to be determined by the interest of the student and instructor. May be taken only with the consent of the department. May be repeated up to a total of 8 credit hours. Prerequisite: CLAS 202 or CLAS 252 or an equivalent approved by the department. Repeatable to 8 credits. On demand.

FREN Courses

FREN 101. First Year French I. 4 Credits.
Introduction to speaking, reading, writing and listening comprehension with a focus on understanding the diversity of our world’s natural heritage as found in the Francophone world. F.S.

FREN 102. First Year French II. 4 Credits.
A continuation of the fundamentals of speaking, reading, writing and listening comprehension with a focus on world issues arising in Francophone countries from the encounter between cultural heritage and natural heritage. Prerequisite: FREN 101 with a grade of a C or better, French placement exam or consent of instructor. F.S.

FREN 201. Second Year French I. 4 Credits.
Fundamentals of French grammar with an emphasis on speaking, reading, writing and listening comprehension and a focus on Francophone world organizations and the solutions they offer to world issues. This course is taught primarily in French. Prerequisite: FREN 102 with a grade of a C or better, French placement exam or consent of instructor. F.

FREN 202. Second Year French II. 4 Credits.
Review of the structure of the French language, continued practice of oral and written expression, introduction to phonetics, and Francophone literatures as a reflection of culture. This course is taught primarily in French. Prerequisite: FREN 201 with a grade of a C or better, French placement exam or consent of instructor. S.

FREN 301. Third Year French I. 3 Credits.
Review of French grammar with an emphasis on written expression and a focus on readings, films and cultures. This course is taught in French. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. F.

FREN 302. Third Year French II. 3 Credits.
Review of French grammar with an emphasis on oral expression, phonetics and pronunciation and a focus on readings, films and cultures. This course is taught in French. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. S.

FREN 305. French Conversation and Culture. 3 Credits.
The study of concepts helpful in describing contemporary cultures and their applications to addressing contemporary issues from both domestic and global perspectives in the francophone world. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. F.

FREN 306. French Conversation and Culture II. 3 Credits.
Contemporary world issues of the French speaking world with an emphasis on oral and written expression. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. S.

FREN 307. A Social and Cultural History of Québec. 3 Credits.
This course focuses on the case of Quebec as an example of North American cultural diversity. It addresses how geography, history, language, ideology, religion and ethnicity help explain cultural differences and their construction of a cultural state. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. On demand.

FREN 340. Business French. 3 Credits.
Oral and written practice with terminology and idioms used in commerce and business correspondence. Readings on such topics as banking, employment, markets, production, services, trade and practices in the French business world. Prerequisite: FREN 301 with a grade of a C or better, French placement exam or consent of instructor. On demand.

FREN 371. Studies in European Francophone Literatures, Films and Cultures. 3 Credits.
Topics for this course may include genre studies, survey of literary and social/political movements, or a specific time period. Depending on the topic and the range of interest outside the major, the course may be taught in French or English. For major or minor credit, written work must be done in French. Repeatable up to 6 credits when course content differs. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. Repeatable to 6 credits. On demand.
FREN 372. Studies in African, Asian, Caribbean, and/or Polynesian Francophone Literatures, Films and Cultures. 3 Credits.
Topics for this course may include genre studies, survey of literary and or social/political movements, or a specific time period. Depending on the topic and the range of interest outside the major, the course may be taught in French or English. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. Repeatable to 6 credits. On demand.

FREN 373. North American Francophone Cultures through Literature and Film. 3 Credits.
A study of issues relating to being francophone in North America, the course examines North American francophone cultural diversity and concepts of difference as seen in literature and film drawn from Quebec, the maritimes, the Canadian prairie provinces, the Middlewest, New England and Louisiana. Topics for this course may include genre studies, survey of literary and or social/political movements, or a specific time period. Depending on the topic and the range of interest outside the major, the course may be taught in French or English. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. Repeatable to 6 credits. On demand.

FREN 413. Advanced French Grammar Review. 3 Credits.
An oral and written approach to French grammar and stylistics. Prerequisite: FREN 302 or equivalent. On demand.

FREN 491. Seminar in French and Francophone Studies. 1-3 Credits.
Topics for this course may include genre studies, survey of literary and or social/political movements, a specific author, or a specific time period. Depending on the topic and the range of interest outside the major, the course may be taught in French or English. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. Repeatable to 6 credits. On demand.

FREN 494. Individual French Readings. 1-3 Credits.
For major or minor credit, written work must be done in French. Topics vary with individual interests and needs and may include genre studies, survey of literary and or social/political movements, or a specific time period. Topics for this course may include genre studies, survey of literary and or social/political movements, or a specific time period. Prerequisite: FREN 202 with a grade of a C or better, French placement exam or consent of instructor. Repeatable to 6 credits. On demand.

GERM Courses

GERM 101. First Year German I. 4 Credits.
Fundamentals of German grammar, oral use of the language and reading of easy German. F.S.

GERM 102. First Year German II. 4 Credits.
Continued study of fundamentals of German grammar, oral use of the language and reading of easy German. Prerequisite: GERM 101 with a grade of C or better. F.S.

GERM 201. Second Year German I. 4 Credits.
Review of the structure of the language, practice in oral and written expression and reading in German. Prerequisite: GERM 102, or equivalent. F.

GERM 202. Second Year German II. 4 Credits.
Review of the structure of the language, practice in oral and written expression and reading in German. Prerequisite: GERM 201 or equivalent. S.

GERM 206. Germany in a Global World. 3 Credits.
Cultural history course exploring the significant past and present global impact of Germany in areas such as aviation history, engineering, scientific innovation and discovery, psychology, politics, music, and the fine arts. No knowledge of German required. On demand.

GERM 304. German Phonetics: History, Dialect, and the Living Language. 3 Credits.
Intensive pronunciation practice leading to proper German sound articulation and to a thorough knowledge of the principles of German pronunciation and intonation. Prerequisite: GERM 201 or equivalent. On demand.

GERM 306. Contextualizing Culture: Introduction to German Studies. 3 Credits.
Interdisciplinary introduction to German Cultural Studies examines the historical development of the modern German nation as reflected in its cultural artifacts: literature, film, architecture, advertising, and visual art. No knowledge of German required. On demand.

GERM 307. Communicating Cultures I. 3 Credits.
Cultures of German-speaking countries are explored through conversation and composition. Prerequisite: GERM 202 or equivalent. F.

GERM 308. Communicating Cultures II. 3 Credits.
Cultures of German-speaking countries are further explored through conversation and composition. Prerequisite: GERM 307 or equivalent. S.

GERM 310. Screening German Cultures. 3 Credits.
Film course treating topics such as (but not limited to): film movements, cinematic adaptations of literary texts, specific directors, Oscar contenders, and the East German film company DEFA. Prerequisite: GERM 202 with a grade of C or better. On demand.

GERM 404. German Stories, German Histories. 3 Credits.
Topics vary: Literary periods and genres, individual authors, or interdisciplinary projects. Repeatable when topics vary. Repeatable to 9 credits. Prerequisite: GERM 308 or equivalent. Repeatable to 9 credits. On demand.

GERM 405. Mediating Cultures: Social Discourse in German-Speaking Countries. 3 Credits.
An exploration of German language media, focusing on social issues, such as multiculturalism, German politics, Germany and the European Union. Prerequisite: GERM 308. On demand.

GERM 406. Literary Voices in Translation. 3 Credits.
Introduction to masterpieces of German, Austrian, and Swiss literature in English. Possible course topics include Holocaust literature, the Grimms’ fairy tales, the monstrous, the uncanny, and the fantastic. Repeatable to 9 credits when topics vary. Repeatable to 9 credits. On demand.

GERM 409. Madness and Genius: An Introduction to German Intellectual History. 3 Credits.
Introduction to major intellectual, literary, and artistic movements of German-speaking cultures from Middle Ages to the present, with emphasis on the historical and philosophical environments in which they came to being. Prerequisite: GERM 308 with a grade of C or better. On demand.

GERM 413. Advanced German Grammar Review. 3 Credits.
Written composition and oral practice, with a review of those aspects of grammar which need most practice on the advanced level. Prerequisite: GERM 308 or equivalent. F.

GERM 494. Individual German Readings. 1-3 Credits.
May be repeated to a total of six hours. Prerequisites: GERM 308 and consent of the department. Repeatable to 6 credits. F.S.

LANG Courses

LANG 101. First Year Foreign Language I. 4 Credits.
Study of the fundamentals of grammar, oral use, and reading of a non-English language. Course credits available to students who demonstrate proficiency in a non-English language not offered at the university. Students who believe they may be eligible for these credits should contact the Department of Modern Classical Languages Literatures for information regarding the course. These credits may or may not fulfill language requirements in majors or programs with such requirements; students should consult with their major department for such a determination. S/U grading. On demand.

LANG 102. First Year Foreign Language II. 4 Credits.
Continued study of the fundamentals of grammar, oral use, and reading of a non-English language. Course credits available to students who demonstrate proficiency in a non-English language not offered at the university. Students who believe they may be eligible for these credits should contact the Department of Modern Classical Languages Literatures for information regarding the course. These credits may or may not fulfill language requirements in majors or programs with such requirements; students should consult with their major department for such a determination. Prerequisite: LANG 101. S/U grading. On demand.

LANG 201. Second Year Foreign Language I. 4 Credits.
Continued study of the fundamentals of grammar, oral use, and reading of a non-English language. Course credits available to students who demonstrate proficiency in a non-English language not offered at the university. Students who believe they may be eligible for these credits should contact the Department of Modern Classical Languages Literatures for information regarding the course. These credits may or may not fulfill language requirements in majors or programs with such requirements; students should consult with their major department for such a determination. Prerequisite: LANG 101 and LANG 102. S/U grading. On demand.

LANG 202. Second Year Foreign Language II. 4 Credits.
Continued study of the fundamentals of grammar, oral use, and reading of a non-English language. Course credits available to students who demonstrate proficiency in a non-English language not offered at the university. Students who believe they may be eligible for these credits should contact the Department of Modern Classical Languages Literatures for information regarding the course. These credits may or may not fulfill language requirements in majors or programs with such requirements; students should consult with their major department for such a determination. Prerequisite: LANG 102. S/U grading. On demand.
LANG 202. Second Year Foreign Language II. 4 Credits.
Continued study of the fundamentals of grammar, oral use, and reading of a non-English language. Course credits available to students who demonstrate proficiency in a non-English language not offered at the university. Students who believe they may be eligible for these credits should consult with their major department for such a determination. Prerequisites: LANG 101, LANG 102, and LANG 201. S/U grading.

LANG 250. Topics in World Languages and Cultures. 1-4 Credits.
Beginning or intermediate instruction on subjects not covered by regular departmental offerings. No prerequisite unless one is specifically announced in the Time Schedule. Repeatable with change of topic. Repeatable. On demand.

LANG 318. Individual Arranged Study Abroad. 1-12 Credits.
Participation in individually arranged programs of study abroad. For major or minor credit, the language used abroad must correspond to the language being studied at UND. The Department reserves the right to test the student upon his or her return to Grand Forks. Repeatable to 12 credits. Prerequisite: Permission of department. Repeatable to 12 credits. S/U grading. F,S,SS.

LANG 319. University Sponsored Study Abroad. 1-12 Credits.
Participation in UND-sponsored programs of study abroad. For major or minor credit, the language used abroad must correspond to the language being studied at UND. Repeatable when programs or topics within a program vary. Repeatable to 12 credits. Prerequisite: LANG 102 or equivalent. Repeatable to 12 credits. S/U grading. On demand.

LANG 331. Foreign Literature in Translation. 1-3 Credits.
The faculty in the various foreign languages will lead reading and discussion in English of representative translations from their fields of specialty. Course may be taken in partial fulfillment of the Humanities requirement, but would not apply toward a language major or minor. Topics to be announced. Repeatable to 6 credits. Repeatable to 6 credits. F,S.

LANG 333. Colloquium In Lang & Letters. 1-3 Credits.
Prerequisite: LANG 102 or equivalent. Repeatable to 12 credits.

LANG 380. Global Gateways. 3 Credits.
An introduction to the interdisciplinary nature of cultural practices and traditions around the world, this course will explore an understanding of culture as historical, literary, linguistic, visual, and performative. Through reading, writing, and discussion to foster advanced communication, students will be expected to engage and examine intercultural contexts and complexities. Repeatable when topics vary. Repeatable to 6 credits. F,S.

LANG 389. Honors Tutorial. 1-4 Credits.
Supervised independent study of topics of mutual interest to students and members of the departmental faculty. May apply toward graduation with Senior Honors. Prerequisite: LANG 302 or equivalent and consent of department. On demand.

LANG 397. Cooperative Education. 1-6 Credits.
Compensated and practical work experience in various areas of the language of study. Coop credits may not be substituted for any required course. Repeatable to 6 credits. Prerequisites: Recommendation of language unit and approval of Department. Repeatable to 6 credits. S/U grading. F,S,SS.

LANG 400. Methods and Materials of Teaching Middle and Secondary School Foreign Language. 3 Credits.
Various teaching methods, strategies and materials used in teaching middle and secondary school foreign language. Prerequisite: T&L 345. Corequisite: T&L 486. F.

LANG 480. Learner-Directed Second Language Acquisition. 3 Credits.
Equips the student for success in learner-directed acquisition of language/culture without dependence on formal classroom instruction, especially in little-studied languages with few or no published pedagogical resources. The core of the course is an intensive practicum (40-45 hours), working with a native speaker of a language that is very different from languages the student already knows, in sessions led first by a teaching assistant and later by students. Separate lecture-discussion sessions present the theoretical foundation for the practicum. An understanding of second language acquisition is instilled that combines Sociocultural Theory with the psycholinguistic study of comprehension and production along with a detailed multiphase strategy for long-term language/culture learning. Corequisite recommended: LING 450 or LING 455. SS.

LING Courses

LING 450. Articulatory Phonetics. 2 Credits.
Introduction to the theory and practice of articulatory phonetics. SS.

LING 451. Phonology I. 3 Credits.
Introduction to phonological analysis; intensive practice in applying theoretical principles to problem solving and to field techniques. Prerequisite: LING 450 or with permission of the instructor ENGL 209 as a prerequisite and LING 450 as a corequisite. SS.

LING 452. Syntax and Morphology I. 3 Credits.
Fundamentals of analyzing the grammatical and morphological structures of languages; analytical skills developed through graded problems based on a wide variety of languages. SS.

LING 455. Phonetics of Signed Languages. 2 Credits.
Intensive drill in recognition and production of a wide range of manual and non-manual phonetic elements that are used in natural signed languages, along with terminology for describing those elements precisely. Practice in reading and writing one or more notational systems that are useful in recording phonetic details when conducting research on signed languages. SS.

LING 470. Introduction to Sociolinguistics and Language Development. 2 Credits.
Introduction to language variation as influenced by social interaction, with special attention to participatory language development in multilingual societies. SS.

LING 480. Learner-Directed Second Language Acquisition. 3 Credits.
Equips the student for success in learner-directed acquisition of language/culture without dependence on formal classroom instruction, especially in little-studied languages with few or no published pedagogical resources. The core of the course is an intensive practicum (40-45 hours), working with a native speaker of a language that is very different from languages the student already knows, in sessions led first by a teaching assistant and later by students. Separate lecture-discussion sessions present the theoretical foundation for the practicum. An understanding of second language acquisition is instilled that combines Sociocultural Theory with the psycholinguistic study of comprehension and production along with a detailed multiphase strategy for long-term language/culture learning. Corequisite recommended: LING 450 or LING 455. SS.

NORW Courses

NORW 101. First Year Norwegian I. 4 Credits.
Introduction to the basic Norwegian language skills: reading, writing, speaking and listening; fundamentals of grammar. F.

NORW 102. First Year Norwegian II. 4 Credits.
Basic Norwegian language skills; continuation of fundamentals of grammar. Prerequisite: NORW 101 with a grade of C or better. S.

NORW 201. Second Year Norwegian I. 4 Credits.
Selected cultural and literary readings, review of the structure of the language, and continued development of readings, writing, speaking, and listening skills. Prerequisite: NORW 102 or equivalent. F.

NORW 202. Second Year Norwegian II. 4 Credits.
Selected cultural and literary readings, continued review of the structure of the language and development of language skills. Prerequisite: NORW 201 or equivalent. S.

NORW 350. Norwegian Culture. 3 Credits.
Taught in English. Open to non-majors. A systematic analysis of Norwegian culture through the centuries. Repeatable when topics vary. Repeatable. F.

NORW 403. Great Literary Works of Norway. 3 Credits.
Taught in English. Open to non-majors. Reading and analysis of selected texts by a major Norwegian author. Repeatable when topics vary. Repeatable. S.

NORW 431. Advanced Norwegian. 3 Credits.
Reading of selected works by leading Norwegian authors, interpretation and discussion. Prerequisite: NORW 202 or equivalent. F.

NORW 432. Advanced Norwegian. 3 Credits.
Reading of selected works by leading Norwegian authors, interpretation and discussion. Prerequisite: NORW 202. S.
NORW 433. Norwegian Literature. 3 Credits.
Norwegian literature, with special attention given to recognized masterpieces, past and present. Prerequisite: NORW 202. F.

NORW 434. Norwegian Literature. 3 Credits.
Norwegian literature with special attention given to recognized masterpieces, past and present. Prerequisite: NORW 202. S.

NORW 494. Individual Norwegian Readings. 1-3 Credits.
May be repeated to a total of six hours. Prerequisites: Six credits of other 400-level Norwegian courses and consent of department. Repeatable to 6 credits. F,S.

RUSS Courses

RUSS 101. First Year Russian I. 4 Credits.
Fundamentals of Russian grammar, oral use of the language and reading of easy Russian. F.

RUSS 102. First Year Russian II. 4 Credits.
Continued study of fundamentals of Russian grammar, oral use of the language and reading of easy Russian. Prerequisite: RUSS 101 with a grade of a C or better. S.

RUSS 161. Introduction to Russian Language. 3 Credits.
An introduction to Russia's writers of the 19th and 20th centuries. In English, but students with adequate language preparation may do some assignments in Russian. On demand.

RUSS 162. Introduction to Russian Culture. 3 Credits.
A survey of Russian culture with emphasis on the 19th and 20th centuries. In English, but students with adequate language preparation may do some assignments in Russian. On demand.

RUSS 201. Second Year Russian I. 4 Credits.
Review of the structure of the language, readings in Russian, practice in oral and written expression. Prerequisite: RUSS 102 or an equivalent approved by the department. F.

RUSS 202. Second Year Russian II. 4 Credits.
Review of the structure of the language, readings in Russian, practice in oral and written expression. Prerequisite: RUSS 201 or an equivalent approved by the department. S.

RUSS 301. Third Year Russian. 3 Credits.
Intensive oral drill, short readings, systematic review of grammar. Emphasis on developing a practical command of spoken Russian. Prerequisite: RUSS 202 or an equivalent approved by the department. F, every year.

RUSS 302. Third Year Russian. 3 Credits.
Intensive oral drill, short readings, systematic review of grammar. Emphasis on developing a practical command of spoken Russian. Prerequisite: RUSS 301 or an equivalent approved by the department. S, odd years.

RUSS 394. Independent Study. 1-3 Credits.
Supervised independent study. Repeatable to 6 credits. Prerequisites: RUSS 202 or equivalent and consent of instructor. Repeatable to 6 credits. F,S.

RUSS 494. Individual Russian Readings. 1-3 Credits.
May be repeated to a total of six hours. Prerequisites: RUSS 302 or equivalent and consent of department. Repeatable to 6 credits. F,S.

SPAN Courses

SPAN 101. First Year Spanish I. 4 Credits.
Principles and fundamental grammatical principles introduced through the development of skill and listening comprehension and speaking, followed by practice in reading and writing. F,SS.

SPAN 102. First Year Spanish II. 4 Credits.
Continued study of pronunciation and fundamental grammatical principles through the development of skill in listening comprehension and speaking, followed by practice in reading and writing. Prerequisite: SPAN 101 with a grade of a C or better. S,SS.

SPAN 201. Second Year Spanish I. 4 Credits.
Review of the structure of the language, readings in Spanish, practice in oral and written expression. Prerequisite: SPAN 102 or an equivalent approved by the department. F,SS.

SPAN 202. Second Year Spanish II. 4 Credits.
Review of the structure of the language, readings in Spanish, practice in oral and written expression. Prerequisite: SPAN 201 or an equivalent approved by the department. S,SS.

SPAN 304. Spanish Phonetics. 3 Credits.
A theoretical and practical approach to Spanish pronunciation. Prerequisite: SPAN 202 or equivalent or permission of instructor. On demand.

SPAN 308. Spanish Conversation. 3 Credits.
Practice in a variety of forms of oral Spanish. Prerequisite: SPAN 202 or an equivalent approved by the department. On demand.

SPAN 309. Spanish Composition. 3 Credits.
Practice in a variety of forms of written Spanish. Prerequisite: SPAN 202 or an equivalent approved by the department. On demand.

SPAN 312. Spanish for the Professions. 3 Credits.
A study of terminologies, cultural contexts, and professional etiquette. Topics will vary. Prerequisites: SPAN 202 or equivalent and permission of instructor. On demand.

SPAN 420. Early Spanish Literature & Culture. 3 Credits.
Lectures, readings, analysis and discussion of representative Early Spanish literary cultural texts. Students will be expected to engage the texts by examining intellectual histories, cultural contexts and complexities of social power and difference as an artistic expression of the human experience. Repeatable when topics vary. Prerequisite: SPAN 308 or SPAN 309, with preference for SPAN 309. On demand.

SPAN 421. Modern & Contemporary Spanish Literature & Culture. 3 Credits.
Lectures, readings, analysis and discussion of representative Modern Contemporary Spanish literary cultural texts. Students will be expected to engage the texts by examining intellectual histories, cultural contexts and complexities of social power and difference as an artistic expression of the human experience. Repeatable when topics vary. Prerequisite: SPAN 308 or SPAN 309, with preference for SPAN 309. On demand.

SPAN 422. Early Latin American Literature & Culture. 3 Credits.
Lectures, readings, analysis and discussion of representative Early Latin American literary cultural texts. Students will be expected to engage the texts by examining intellectual histories, cultural contexts and complexities of social power and difference as an artistic expression of the human experience. Repeatable when topics vary. Prerequisite: SPAN 308 or SPAN 309, with preference for SPAN 309. On demand.

SPAN 423. Modern & Contemporary Latin American Literature & Culture. 3 Credits.
Lectures, readings, analysis and discussion of representative Modern Contemporary Latin American literary cultural texts. Students will be expected to engage the texts by examining intellectual histories, cultural contexts and complexities of social power and difference as an artistic expression of the human experience. Repeatable when topics vary. Prerequisite: SPAN 308 or SPAN 309, with preference for SPAN 309. On demand.

SPAN 424. Early Latin American Literature. 3 Credits.
An in-depth examination of the grammar of the Spanish language. Emphasis will be placed on those elements of Spanish which present the greatest difficulties for native speakers of English. Prerequisite: SPAN 309 or permission of instructor. S.

SPAN 462. Seminar in Hispanic Literature, Culture and Linguistics. 3 Credits.
Advanced work on a specific aspect of the Hispanic literary, linguistic, and/or cultural tradition. Repeatable with different topic. Prerequisite: SPAN 308 or SPAN 309, with preference for SPAN 309. Repeatable. On demand.

SPAN 494. Individual Hispanic Readings. 1-3 Credits.
Independent study on specific topic pre-arranged with professor. Prerequisites: SPAN 307 or equivalent and consent of the department. Repeatable to 3 credits. F,S.

Leadership Minor (Lead)

http://business.und.edu/undergraduate/management/leadership-minor.cfm

The minor in leadership provides in-depth instruction on desired qualities of leaders, the relationship between leaders and followers, and explores what has contributed to successful leadership in a variety of fields. The courses and experiences provide the training necessary for UND graduates to serve
as leaders in their community and professions. For further information, contact the Helland Family Office of Academic Advisement (http://business.und.edu/current-students/academic-advising) in the CBPA 701.777.2975

LEAD 101 Learning Leadership 3
COMM 212 Interpersonal Communication 3
LEAD 400 Advanced Leadership 4

Select one of the following (Ethics):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHIL 250</td>
<td>Ethics in Engineering and Science</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 252</td>
<td>Ethics in Business and Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 253</td>
<td>Environmental Ethics</td>
<td>3</td>
</tr>
<tr>
<td>RELS 342</td>
<td>Religious Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives 7

Total Credits 20

* To be chosen in consultation with the minor advisor from courses that have significant leadership components and are educationally appropriate to meet the goals of the student and the program.

Courses

LEAD 101. Learning Leadership. 3 Credits.
An introduction to leadership as a discipline including the theories of leadership, the role of leadership in history and today’s society, communication and interaction with diverse individuals and groups, basic network-building concepts and assessment of application of leadership theory and skills. F.S.

LEAD 395. Special Topics. 1-4 Credits.
Topics will vary. Course will offer specialized knowledge in a specific area related to leadership. Prerequisite: Consent of the instructor. Repeatable to 4 credits. On demand.

LEAD 400. Advanced Leadership. 4 Credits.
An in-depth analysis of the applications of leadership skills in a variety of contexts, including an experiential analysis of self (and others) as a leader within context. Students will demonstrate creative and critical thinking about leadership, communicate effectively in oral and written format, and apply networking concepts and leadership skills in an applied setting. Prerequisites: LEAD 101, completion of one ethics course, and enrollment in the minor. S.

LEAD 494. Readings in Leadership. 1-4 Credits.
Selected readings in leadership developed individually for each student. Prerequisites: Consent of the instructor; must be enrolled in the Leadership minor. Repeatable to 4 credits. F,S,SS.

LEAD 497. Internship in Leadership. 1-4 Credits.
Guided, practical experience in leadership with selected organizations. Instructor, working with others in the organization, will work to help mentor students in developing their leadership skills. Prerequisites: Must be enrolled in the leadership minor; requires consent of instructor. Repeatable to 4 credits. S/U grading. F,S,SS.

Linguistics (Ling)

http://arts-sciences.und.edu/summer-institute-of-linguistics

Linguistics courses are taught through a cooperative program between UND and SIL International during a nine-week summer session every year. Introductory courses are at the undergraduate level; advanced courses are at the graduate level but are open to undergraduates who meet their prerequisites. Courses focus on theoretically-informed descriptive linguistics in preparation for careers involving minority-language communities and lesser-studied languages. They are particularly appropriate for students anticipating careers in language development, documenting endangered languages, language survey, translation, and literacy.

It is possible for students to earn a minor in linguistics; for details, see the Minors section. Students may take up to 20 credits of Linguistics courses as undergraduates without applying to a degree program.

Deadlines: U.S. citizens who wish to take courses listed under Linguistics (whether in a degree program or not) should fill in SIL’s pre-application form on their website (http://arts-sciences.und.edu/summer-institute-of-linguistics/frm-apply.cfm) (http://applying.silund.org). This needs to be done before each summer that a student wants to enroll, preferably by April 1. International students who are not already on campus should submit the pre-application form each year by February 15 and complete any admissions requirements by March 1.

Other information about the application process, deadlines, courses, schedules, etc. is available at the above website address or call 1-800-292-1621. The chair of the linguistics program is Albert Bickford, SIL-UND, 16131 N. Vernon Dr., Tucson, AZ 85739 (director_silund@sil.org). Information is also available from the SIL office on campus when the courses are in session during the summer (701-777-0575).

Other departments also offer undergraduate courses relevant to linguistics, especially English, Languages, and Communication Sciences and Disorders.

Minor in Linguistics

Emphasizing both cognitive understanding and analytical skills, the undergraduate minor in Linguistics provides an introduction to the scientific study of language, as a supplement to a student’s primary academic concentration. Its purpose is to provide a foundation for a graduate degree or other further education in linguistics or related fields, and to prepare students for informed decision-making about language-related issues in their daily life and civic responsibilities. The courses are offered in three core subfields of linguistics: phonetics, phonology, and morphology/syntax, as well as other subfields (including interdisciplinary and applied). The minor promotes familiarity with a broad range of languages, especially minority languages.

The total requirement for the minor is 20 credits, including the following:

Prerequisites to the minor

ENGL 209 Introduction to Linguistics (also offered as Lang 207) 3
2.8 GPA and junior standing or special permission

Required core courses

LING 450 Articulatory Phonetics 2
LING 451 Phonology I 3
LING 452 Syntax and Morphology I 3

Non-core courses with linguistics content

Select three of the following: 9

- ENGL 229 Diversity in U.S. Literatures
- ENGL 309 Modern Grammar
- ENGL 370 Language and Culture
- ENGL 417 Special Topics in Language
- ENGL 418 Second Language Acquisition
- ENGL 419 Teaching English as a Second Language
- ENGL 442 History of the English Language
- LING 455 Phonetics of Signed Languages
- LING 470 Introduction to Sociolinguistics and Language Development
- LING 480 Learner-Directed Second Language Acquisition

Total Credits 20

Other upper-division or graduate courses whose content is linguistics, subject to approval by one of the program advisors.

Language requirement for the minor:

Three credits in a non-Indo-European language. If a suitable language is used to satisfy the language requirement of a student’s major, it may also be used to satisfy the language requirement of the minor. The following courses are among those that may be used to satisfy the language requirement:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 101</td>
<td>First Year Chinese I</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 102</td>
<td>First Year Chinese II</td>
<td>4</td>
</tr>
<tr>
<td>CSD 101</td>
<td>American Sign Language I</td>
<td>2</td>
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<tr>
<td>CSD 102</td>
<td>American Sign Language II</td>
<td>2</td>
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<tr>
<td>CSD 201</td>
<td>American Sign Language III</td>
<td>2</td>
</tr>
<tr>
<td>IS 250</td>
<td>Lakota Language I</td>
<td>3</td>
</tr>
<tr>
<td>IS 251</td>
<td>Lakota Languages II</td>
<td>3</td>
</tr>
<tr>
<td>IS 350</td>
<td>Native American Languages</td>
<td>3</td>
</tr>
</tbody>
</table>
LING 480 Learner-Directed Second Language Acquisition (This course may be used to satisfy both the language requirement and the non-core requirement) 3

Total Credits 26

Other language courses in non-Indo-European languages may be used with the approval of a program advisor, including transfer courses.

The language requirement may also be satisfied by examination or by native competence in a suitable language, subject to approval by a program advisor.

Deaf students may, in consultation with a program advisor, substitute appropriate courses in the phonetics and phonology of sign language for LING 450 Articulatory Phonetics and LING 451 Phonology I if they also use a sign language to satisfy the non-Indo-European language requirement.

1 SIL requires a 2.8 GPA and junior standing in order for students to take its courses. Any exceptions to these requirements would need to be granted by the SIL director.

2 ENGL 418 Second Language Acquisition and LING 480 Learner-Directed Second Language Acquisition are distinct courses in content and aims. ENGL 418 Second Language Acquisition focuses more on a cognitive and theoretical understanding of second language acquisition, particularly for language teaching of world languages in a traditional classroom setting. LING 480 Learner-Directed Second Language Acquisition provides a practical approach to second language acquisition in a non-traditional, user-directed context where traditional instruction and resources are not available, as is typical in minority languages.

3 See footnote 2.

The minor is offered jointly by the English department and SIL; interested students should contact the English department for further information and advising.

Courses

LING 450. Articulatory Phonetics. 2 Credits. Introduction to the theory and practice of articulatory phonetics. SS.

LING 451. Phonology I. 3 Credits. Introduction to phonological analysis; intensive practice in applying theoretical principles to problem solving and to field techniques. Prerequisite: LING 450 or with permission of the instructor ENGL 209 as a prerequisite and LING 450 as a corequisite. SS.

LING 452. Syntax and Morphology I. 3 Credits. Fundamentals of analyzing the grammatical and morphological structures of languages; analytical skills developed through graded problems based on a wide variety of languages. SS.

LING 455. Phonetics of Signed Languages. 2 Credits. Introduction to the theory and practice of sign language phonetics. Intensive drill in recognition and production of a wide range of manual and non-manual phonetic elements that are used in natural signed languages, along with terminology for describing those elements precisely. Practice in reading and writing one or more notational systems that are useful in recording phonetic details when conducting research on signed languages. SS.

LING 470. Introduction to Sociolinguistics and Language Development. 2 Credits. Introduction to language variation as influenced by social interaction, with special attention to participatory language development in multilingual societies. SS.

LING 480. Learner-Directed Second Language Acquisition. 3 Credits. Equips the student for success in learner-directed acquisition of language/culture without dependence on formal classroom instruction, especially in little-studied languages with few or no published pedagogical resources. The core of the course is an intensive practicum (40-45 hours), working with a native speaker of a language that is very different from languages the student already knows, in sessions led first by a teaching assistant and later by students. Separate lecture-discussion sessions present the theoretical foundation for the practicum. An understanding of second language acquisition is instilled that combines Sociocultural Theory with the psycholinguistic study of comprehension and production along with a detailed multiphase strategy for long-term language/culture learning. Corequisite recommended: LING 450 or LING 455. SS.

Management (Mgmt)

http://business.und.edu/undergraduate/management/index.cfm

Chuang, Francis, Helleloid, Hollingworth (Chair), Jones, Nam, Schultz, Valentine and Vilton

As part of the College of Business and Public Administration, the Department of Management provides courses in the fundamentals of organizations and management, emphasizing both theory and practice of management concepts. Students are exposed to current information concerning the study and practice of business management. Students develop an understanding of current management concepts and practices, build problem-solving and communication skills, and appreciate the ethical implications of managerial work. Topics of interest in management include: decision-making and planning; organizing processes and resources for effective action; leading and motivating organization members; and the impact of technology in the workplace and the competitive environment. The faculty are dedicated, motivated, caring, experienced, and academically and professionally qualified; value meaningful student-faculty interaction; and search out and use current instructional resources and methods. Management faculty also emphasize expanding the boundaries of theory, practice, and teaching by engaging in basic, applied, and instructional research and providing service to the university, business, professional, and local communities.

The Department of Management offers a comprehensive undergraduate program in management through a variety of courses in organizations and management theory, human resources, operations and supply chain management, and strategic management. The purpose of the program is to prepare the student for the challenges of modern management by providing an overall understanding of the basic functions of management as well as appropriate skills and problem solving methods. The program introduces the student to the complexities of organizational variables and provides an appropriate framework for examining various institutions and the external environment in which these units operate. The Management department provides students with several majors in which they may specialize, including: Human Resource Management; Management; and Operations and Supply Chain Management. Airport Management and Aviation Management are offered through the College of Business and Public Administration in cooperation with the John D. Odegard School of Aerospace Sciences. Minors in Leadership and Operations and Supply Chain Management are also offered.

B.B.A. with a Major in Human Resource Management (p. 172)

B.B.A. with a Major in Operations and Supply Chain Management (p. )

B.B.A. with a Major in Management (p. )

B.B.A. with a Major in Airport Management (p. )

B.B.A. with a Major in Aviation Management (p. )

Requirements for ALL Management Department Majors (p. 173)


B.B.A. with a Major in Human Resource Management

The Human Resource Management major is designed to prepare students to take on the role of a human resource professional in today’s organizations. Many organizations, large and small, have employees dedicated to making certain the organization is hiring, developing and retaining, its human capital. Key topics in the major include recruiting, selecting, compensating, training, and appraising employees as part of strategic human resource management practices.

The courses in this major follow guidelines developed by the Society for Human Resource Management and the Association to Advance Collegiate Schools of Business, and are designed to prepare students to move directly into positions of responsibility in human resource management.
**B.B.A. with a Major in Operations and Supply Chain Management**

The Operations and Supply Chain Management major provides students with the knowledge and skills to assist in the design, implementation, and control of efficient and effective supply chains. The success of many firms depends upon their ability to work with suppliers, distributors, customers, intermediaries, and service providers worldwide. Developing a firm's supply chain network, including the relationships and technology necessary to have the network operate and adapt efficiently and effectively, can be the difference between success and failure for many manufacturing and service firms. This major provides students with quantitative and conceptual tools that will facilitate effective management of their organization's operations and supply chains.

**B.B.A. with a Major in Management**

The UND Management program develops student's ability to analyze and solve problems confronting today's for-profit and not-for-profit organizations. Students learn about decision-making and planning, organizing resources and work processes, leading groups, and managing technology. The Management curriculum is broad enough to prepare students for a variety of career opportunities. Surveys of past graduates identify this breadth as a major strength of the program. In addition to coursework, many management students also pursue internship opportunities with businesses. The program provides a background of professional education for general management or human resource careers in retail, manufacturing, banking, aviation, health care, public service, and other fields where sound management skills are important.

**B.B.A. with a Major in Airport Management**

The Airport Management curriculum is offered to those students seeking employment in administrative positions with companies in, and related to the, groundside activities of the aviation industry. All aspects of general aviation, air carrier and the total aviation industry will be studied in depth with sufficient flexibility in courses to allow the student to concentrate in a particular area of the industry such as general aviation operations, airline management, airport administration, or corporate aviation management. Requires a private pilot certificate.

**B.B.A. with a Major in Aviation Management**

This curriculum is for those students whose career objectives are toward the management and operation of the airside activities of the aviation industry. The program provides a thorough foundation in both aviation and business. By graduation, students will have earned a minimum of an FAA Commercial Pilot Certificate with Instrument and Multi-Engine Ratings.

**Human Resource Management Major Requirements**

**Requirements for ALL Management Department Majors:**

**UND Requirements:**

1. Minimum 125 credit hours.
2. At least 36 credit hours must be from courses numbered 300 and above.
3. At least 60 credit hours must be from a 4-year institution.

**UND Essential Studies Requirements:**

See UND Essential Studies Requirements, current list of eligible courses, and consult with your adviser.

**Required courses**

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</tr>
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**Total Credits: 25**

**CoBPA Requirements**

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</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MKRT 305</td>
<td>Marketing Foundations</td>
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**Total Credits: 24**

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<td>3</td>
</tr>
<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 407</td>
<td>Wage and Salary Administration</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 408</td>
<td>Issues in Human Resource Management</td>
<td>3</td>
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<td>MGMT 410</td>
<td>Staffing: Recruitment and Selection</td>
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<td>MGMT 412</td>
<td>Training and Development</td>
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**Major Elective Requirements**

Select courses from the following list to complete the necessary elective credits:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ECON 341</td>
<td>Labor Economics and Labor Relations</td>
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<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
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</tr>
<tr>
<td>LEAD 400</td>
<td>Advanced Leadership</td>
<td></td>
</tr>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
<td></td>
</tr>
<tr>
<td>MGMT 395</td>
<td>Special Topics 1</td>
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<tr>
<td>MGMT 397</td>
<td>Cooperative Education</td>
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<tr>
<td>MGMT 409</td>
<td>Union-Management Relations</td>
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<tr>
<td>MGMT 420</td>
<td>Multinational Management</td>
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</tr>
<tr>
<td>MGMT 431</td>
<td>Supply Chain Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 497</td>
<td>Internship in Management</td>
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</tr>
<tr>
<td>PSYC 301</td>
<td>Industrial and Organizational Psychology 2</td>
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</tr>
</tbody>
</table>

**Total Credits: 32**

1 Not all "Topics" courses offered in management may be appropriate for this major; therefore, individual "Topics" courses must be approved by the Management Department for this major.

2 It is recommended that PSYC 301 Industrial and Organizational Psychology be taken no later than the first semester of the junior year.

**Operations and Supply Chain Management Major Requirements**

**Requirements for ALL Management Department Majors:**

**UND Requirements:**

1. Minimum 125 credit hours.
2. At least 36 credit hours must be from courses numbered 300 and above.
3. At least 60 credit hours must be from a 4-year institution.

UND Essential Studies Requirements:

See UND Essential Studies Requirements, current list of eligible courses, and consult with your adviser.

Required courses

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Total Credits 6

CoBPA Pre-business Core Requirements:

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<td>Personal Productivity with Information Technology</td>
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<td>3</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
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Total Credits 25

CoBPA Requirements

<table>
<thead>
<tr>
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Total Credits 24

Major Requirements

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<th>Course</th>
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<tbody>
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<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 431</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 432</td>
<td>Supplier Relationship Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 433</td>
<td>Logistics in the Supply Chain</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 24

Major Elective Requirements

Select courses from the following list to complete at least the required number of elective credits:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 320</td>
<td>Cost Accounting ¹</td>
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<tr>
<td>ISBC 320</td>
<td>Professional Communication for Business</td>
<td></td>
</tr>
<tr>
<td>LEAD 400</td>
<td>Advanced Leadership</td>
<td></td>
</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
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</tr>
<tr>
<td>MGMT 361</td>
<td>Alternative Dispute Resolution</td>
<td></td>
</tr>
<tr>
<td>MGMT 362</td>
<td>Leadership and Conflict Resolution</td>
<td></td>
</tr>
<tr>
<td>MGMT 395</td>
<td>Special Topics (with approval) ³</td>
<td></td>
</tr>
<tr>
<td>MGMT 397</td>
<td>Cooperative Education</td>
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<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
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</tr>
<tr>
<td>MGMT 420</td>
<td>Multinational Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 494</td>
<td>Readings in Management (with approval of instructor)</td>
<td></td>
</tr>
<tr>
<td>MGMT 497</td>
<td>Internship in Management</td>
<td></td>
</tr>
<tr>
<td>TECH 433</td>
<td>Manufacturing Strategies</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 32

¹ The co- or pre-requisite requirement of ACCT 218 Advanced Spreadsheet Applications will be waived for Operations and Supply Chain Management Majors on this course.
² Pre-requisite requirements for this course beyond major courses may be required; consult current catalog and instructor.
³ Not all “Topics” courses offered in management may be appropriate for this major; therefore, individual “Topics” courses must be approved by the Management Department for this major.

Management Major Requirements

Requirements for ALL Management Department Majors:

UND Requirements:

1. Minimum 125 credit hours.
2. At least 36 credit hours must be from courses numbered 300 and above.
3. At least 60 credit hours must be from a 4-year institution.

UND Essential Studies Requirements:

See UND Essential Studies Requirements, current list of eligible courses, and consult with your adviser.

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Total Credits 6

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Total Credits 25

CoBPA Requirements

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Total Credits 24

Major Elective Requirements

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<tbody>
<tr>
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<td>MGMT 361</td>
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</tbody>
</table>

Total Credits 20
In order to be admitted to a program leading to the Bachelor of Business Administration degree with a major in Management, a student must have earned at least a 2.75 cumulative and institutional grade point average (GPA). In order to graduate with the BBA degree in Management, a student must achieve at least a 2.75 cumulative CoBPA and institutional GPA. (Note: transfer students must not only earn a minimum cumulative GPA of 2.75, but must also earn a minimum institutional GPA of 2.75 for studies completed at the University of North Dakota). These GPA requirements are in addition to those required by the College of Business and Public Administration.

### Airport Management Major Requirements

**Requirements for ALL Management Department Majors:**

**UND Requirements:**

1. Minimum 125 credit hours.
2. At least 36 credit hours must be from courses numbered 300 and above.
3. At least 60 credit hours must be from a 4-year institution.

**UND Essential Studies Requirements:**

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**CoBPA Pre-business Core Requirements:**

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**CoBPA Requirements**

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**Aviation Courses**

<table>
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<th>Course Title</th>
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<tr>
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<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>5</td>
</tr>
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<td>AVIT 103</td>
<td>Introduction to Air Traffic Control</td>
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</tr>
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<td>3</td>
</tr>
<tr>
<td>GEOL 103</td>
<td>Introduction to Environmental Issues</td>
<td>3</td>
</tr>
</tbody>
</table>

**Select one of the following:**

- AVIT 405  | Airline Operations and Management                | 3       |
- AVIT 407  | General Aviation Operations and Management       | 3       |

**Total Credits**

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>3</td>
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**Advanced Business Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

**Select one of the following:**

- POLS 308  | Intergovernmental Relations                       | 3       |
- or GEOG 474/474L | Introduction to Geographic Information Systems (GIS) | 3       |
- or POLS 432 | Public Policy Making Process                      | 3       |

**Electives to total 125 credits.**

**Total Credits**

<table>
<thead>
<tr>
<th>Credits</th>
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<tr>
<td>50</td>
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</tbody>
</table>

### Aviation Management Major Requirements

**Requirements for ALL Management Department Majors:**

**UND Requirements:**

1. Minimum 125 credit hours.
2. At least 36 credit hours must be from courses numbered 300 and above.
3. At least 60 credit hours must be from a 4-year institution.

**UND Essential Studies Requirements:**

See UND Essential Studies Requirements, current list of eligible courses, and consult with your adviser.

**Required courses**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>PSYC 111</td>
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<tr>
<td>or SOC 110</td>
<td>Introduction to Sociology</td>
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</tr>
<tr>
<td>or ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
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**Total Credits**

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**CoBPA Pre-business Core Requirements:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
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</tr>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<td>MATH 146</td>
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**Total Credits**

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**CoBPA Requirements**

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<tr>
<td>ACCT 315</td>
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**Total Credits**

<table>
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<td>AVIT 100</td>
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<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>5</td>
</tr>
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**Electives to total 125 credits.**

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Minor in Leadership

(See separate listing under Leadership Minor (p. 170))

Operations and Supply Chain Management Minor Requirements

Students will be required to successfully complete all of the following courses, each of which is a 3-credit hour course.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 431</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 432</td>
<td>Supplier Relationship Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 433</td>
<td>Logistics in the Supply Chain</td>
<td>3</td>
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Total Credits: 21

Students are expected to complete the pre-requisite courses of the required courses listed above. Possible exceptions are noted below:

- ECON 210 Introduction to Business and Economic Statistics (which is a pre-requisite course for MGMT 301 Operations Management and MGMT 310 Organizational Behavior) may be waived by providing evidence of an adequate background and, or training in applied statistics to the Management Department.
- Non-CoBPA majors may request that the ISBC department waive ISBC 117 Personal Productivity with Information Technology pre-requisite requirement for ISBC 217 Fundamentals of Computer Information Systems, based upon potentially acceptable alternative coursework that the ISBC department finds acceptable. Students should contact the ISBC department with their request.
- MGMT 300 Principles of Management (which is a pre-requisite for MGMT 302 Human Resource Management and MGMT 310 Organizational Behavior) may be waived by demonstration of acceptable alternative coursework. Requests should be directed to the Management Department.

This minor will not be available to any of the following 'Management'-oriented majors: Management, Operations and Supply Chain Management, Human Resource Management.

Courses

MGMT 300. Principles of Management. 3 Credits.

This course provides a survey of the traditional functions of management with primary emphasis on planning, organizing, controlling, and leading. This emphasis involves coverage of managerial decision making, leadership, motivation, interpersonal communication, staffing human resources, and organizational structure, design, and change and development. Additional topics include the history of managerial thought, management information systems, international management, and business ethics and social responsibility. Prerequisites or corequisites: Sophomore standing or higher with a total of 50 or more credit hours, including courses in progress. F.S.

MGMT 301. Operations Management. 3 Credits.

This course introduces managerial issues and problems arising in the operations function of both service and manufacturing-oriented organizations. Topics include: aggregate planning, facility layout, forecasting, inventory control and management, introduction to linear programming, operations strategy, processes and technology, project management, quality control and management, scheduling, supply chain management, and waiting line analysis. Prerequisites: ECON 210 with grade of C or better, Junior or Senior standing, a GPA of 2.5, and declared CoBPA majors only. F.S.

Minor in Operations and Supply Chain Management

The Operations and Supply Chain Management minor provides students with a broad conceptual grounding in Operations and Supply Chain Management. The program includes significant background in management theory, practice, and skills development, providing students with managerial perspective that they will need to be successful in their careers. The minor also provides specific focus on operational issues in manufacturing and service organizations, as well as significant skill sets to facilitate operationally effective and efficient decision-making. Finally, the minor includes a balanced perspective by addressing relevant issues, practices, and principles of supplier management, supply chains, and logistics issues to assure that students are well grounded in supply chain management.
MGMT 302. Human Resource Management. 3 Credits.
A survey of the concepts, procedures, and programs associated with Human Resources Management in organizations. It includes an overview of the basic management functions and legal issues linked to the execution of the personnel functions of employment, performance appraisal, training, compensation, and development. Prerequisites: ECON 210 with grade of C or better, MGMT 300 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. F,S.

MGMT 309. Quantitative Methods for Managers. 3 Credits.
Topics include decision analysis, forecasting, linear programming (formulation, sensitivity analysis), integer and mixed programming, network models, queuing analysis, and simulation. Prerequisites: ECON 210 with grade of C or better, MGMT 301 with grade of C or better, Junior or Senior Standing, and declared COBPA majors only. F.S.

MGMT 310. Organizational Behavior. 3 Credits.
The objective of this course is to allow the student to become acquainted with and experience various ways of thinking about and responding to the issues of human relations and management. The course is designed to survey the following topics at the individual, group, and organizational levels: individual perceptions, attitudes, values, motivation, leadership, communication, group dynamics, and problem solving. Prerequisites: ECON 210 with grade of C or better, MGMT 300 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. F.S.

MGMT 361. Alternative Dispute Resolution. 3 Credits.
A survey of negotiation, arbitration, and emerging methods of alternative dispute resolution. Students will be required to engage in small and large group discussions, simulated negotiations and mediations in addition to regular reading assignments. On demand.

MGMT 362. Leadership and Conflict Resolution. 3 Credits.
This course will explore the nexus between leadership and the ability to navigate through the tough waters of conflict. Participants will be encouraged to reflect, explore, and apply concepts that will help them to achieve success in their professional and personal lives. On demand.

MGMT 395. Special Topics. 3 Credits.
Specific topics will vary. Course will offer specialized knowledge in a specific area; e.g. Human Resource Management, Operations Management, Strategic Management. May be taken a maximum of two times for credit. Prerequisites: MGMT 300 and declared COBPA majors; Management department may require additional prerequisites for specific sections; Management department approval. Repeatable to 6 credits. On demand.

MGMT 397. Cooperative Education. 1-2 Credits.
On-the-job compensated experience in general management or human resource management, operations or supply chain management. A minimum of 6 credits cumulative from MGMT 397 and MGMT 497 are allowed to be used towards the above mentioned degree programs. Prerequisites: MGMT 300, GPA of 2.75 and consent of instructor. Repeatable to 6 credits. S/U grading. F,S,SS.

MGMT 400. Organizational Theory and Analysis. 3 Credits.
The course is designed to acquaint students with some of the alternative ways in which organizations may be designed to accomplish their tasks. The course reviews the development of organization theories, their current status, and their future. Emphases are placed on the analyses of system theories pertaining to structure, process, and context. Prerequisites: MGMT 300 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. Prerequisite or Corequisite: MGMT 310 with grade of C or better. F.S.

MGMT 407. Wage and Salary Administration. 3 Credits.
The role of a wage and salary administrator is studied. The course focuses on the fundamentals of wage theory, job evaluation and pricing, employee evaluation, individual and group incentive plans, benefits, and managerial/executive compensation. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared CoBPA majors only. F.

MGMT 408. Issues in Human Resource Management. 3 Credits.
This course is designed to facilitate a more in-depth study of selected issues confronting organizations in the area of personnel administration. Treatment of these issues will be accomplished utilizing some combination of the following methods: extensive reading and class discussion, individual student reports, case study analysis, and/or individual student projects. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. S.

MGMT 409. Union-Management Relations. 3 Credits.
This course provides the student with an overview of the role of labor unions in contemporary organizations. The primary emphasis of the course is on the collective bargaining process. Students are engaged in simulated collective bargaining processes involving negotiations, mediation, arbitration, and final contractual agreements. Causes of industrial disputes and grievance arbitration are also covered. Prerequisites: MGMT 302, Junior or Senior standing, and declared COBPA majors only. S.

MGMT 410. Staffing: Recruitment and Selection. 3 Credits.
This course trains students in one of the major components (applicant recruitment and selection) for Human Resource professionals as well as managers. In doing so, students are introduced to the techniques of analyzing the effectiveness and appropriateness of various instruments used by professionals. Additionally, students are introduced to the strategies associated with the use of different recruitment and selection techniques. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. S.

MGMT 412. Training and Development. 3 Credits.
This course trains students in one of the major components (employee training and development) for Human Resource professionals as well as managers. In doing so: students are introduced to the current state of employee training and development practices; acquire a basic understanding of key issues related to the structure, the methods, and the use of technology for the training of employees; and through readings, lectures, discussions, and presentations learn to apply learning theories in the development and implementation of a strategic employee training system. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. F.

MGMT 420. Multinational Management. 3 Credits.
This course is an introduction to the dynamics of management processes encountered in a multinational business setting. It covers comparative management systems and analysis of various environmental conditions for making effective managerial decisions within a multinational company. Adaptation to different cultures is emphasized as one of the essential components of the successful multinational management equation. Prerequisites: MGMT 300, FIN 310, Junior or Senior standing, and declared COBPA majors only. F.

MGMT 431. Supply Chain Management. 3 Credits.
This course covers the set of approaches utilized to efficiently integrate activities of suppliers, operations/production, and distribution of goods and services. Topics include: logistics, inventory, information systems, integration, alliances, procurement, international issues, coordination of product/service and processes in a supply chain, customer value, and decision support. Prerequisites: MGMT 301 with grade of C or better and declared COBPA major. S.

MGMT 432. Supplier Relationship Management. 3 Credits.
This course focuses on the “upstream” portion of the supply chain and stresses managerial issues in supplier relations. Topics covered include: cross-functional issues in supply management, social responsibility, buyer-supplier relationships, quality management, total cost of ownership, developing supply requirements, strategic sourcing, cost management, relationship management, and world-class supply management. Prerequisites: MGMT 301 with grade of C or better and declared COBPA majors. F.

MGMT 433. Logistics in the Supply Chain. 3 Credits.
The primary emphasis of this course is directed toward dealing effectively with the management problems associated with moving and storing goods throughout the supply chain. Major topics covered include: logistic network strategy and planning, transportation strategy, inventory strategy, location strategy, Prerequisites or Corequisites: MGMT 309 with grade of C or better and declared CoBPA majors only. F.

MGMT 475. Strategic Management. 3 Credits.
This is the capstone course in business. Students apply knowledge gained in accounting, economics, finance, management, and marketing to develop business strategies. Case studies, simulations, and other exercises are used to develop executive skills. Prerequisites: MGMT 300, MGMT 301, FIN 310, MKRT 305, Junior or Senior Standing and 105 credits, and declared CoBPA majors only. F,S,SS.

MGMT 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Prerequisite: HON 401. Repeatable to 9 credits. F,S,SS.
MGMT 494. Readings in Management. 1-4 Credits.
Selected readings in management. Prerequisites: Senior or graduate standing and consent of instructor. F,S.

MGMT 497. Internship in Management. 1-3 Credits.
Guided, practical experience in human resource management, production, operations, supply chain management, or general management, with selected participating businesses or organizations. A maximum of 6 credits cumulative from MGMT 397 and MGMT 497 are allowed to be used towards a degree program. Prerequisites: MGMT 300, GPA of 2.75, and consent of instructor. Repeatable to 6 credits. S/U grading. F,S,SS.

**Marketing (MRKT)**

http://business.und.edu/undergraduate/marketing/index.cfm

Askim-Lovseth (Chair), Bateman, Luck, Stoner, and Wang

The Marketing Department offers programs in preparation for careers in profit and non-profit organizations where skills in professional selling, promotion, pricing, research, distribution, and product/brand management are necessary. The undergraduate curriculum consists of a range of required and elective courses designed to establish core competencies in the field while also encouraging a choice of career focus. Virtually all coursework includes emphases on improving writing and speaking skills and the use of contemporary technology and analytical skills necessary to effective marketing managers. Students enjoy a range of opportunities for group projects, many with a hands-on element with businesses, both in regular classes and through internships and cooperative education. The Department encourages its majors to consider opportunities for personal and intellectual growth through exchange programs with business programs in China and France.

Physical facilities include the Page Family Marketing Center, with a state-of-the-art computer lab and conference room. The Department faculty takes pride in the quality and currency of its programming. Professors are regularly recognized for their excellence in the classroom as well as for the high quality of their applied research and service to regional and national firms, and the quality of basic research published in the field of Marketing.

**College of Business and Public Administration**

**B.B.A. with Major in Marketing**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Business and Public Administration Requirements (see BPA (p. 611) listing) and including:

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<tr>
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<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
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<td>&amp; ACCT 201</td>
<td>&amp; Elements of Accounting II</td>
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<tr>
<td>ECON 201</td>
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<td>FIN 310</td>
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<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
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<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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</table>

Select one of the following: 3

**Courses**

**MRKT 201. Personal Marketing. 3 Credits.**

The course applies the marketing concept to planning of career tracks. Emphasis is placed on the development of individual marketing plans during the sophomore/junior year thus initiating a systematic career planning process. Career planning prior to the senior year helps incorporate internships, job shadowing, and/or cooperative education into students’ program of study. Particular emphasis is placed on the application of the marketing concepts in professional career initiation and on the development and delivery of marketing presentations. The course also incorporates attitude testing, mock interviews, discussion of job search using the Internet, networking, time management strategies, and portfolio development. S.

**MRKT 305. Marketing Foundations. 3 Credits.**

An overview of the scope and nature of market exchange and the buyer’s pivotal role. Prerequisites: ECON 201, Sophomore, or Junior Standing, a minimum total of 50 credit hours, and declared and pre-COBPA majors only. Prerequisites or Corequisites: ACCT 201 and ECON 210. F,S.

**MRKT 310. Consumer Behavior. 3 Credits.**

Theoretical and applied analysis of consumption-related activities of individuals. Investigations of the reasons behind and the forces influencing the selection, purchase, use, and disposal of goods and services. Prerequisites: MRKT 305, Sophomore standing or higher, and declared COBPA majors only. F,S.

**MRKT 311. Professional Selling. 3 Credits.**

The professional selling process including prospecting, qualifying, need-discovery and development, relationship-building, presentations, handling objections, closing, and post-sale service. Prerequisites: MRKT 305, Sophomore standing or higher, and declared COBPA majors only. F,S.

**MRKT 315. Retail Management. 3 Credits.**

Application of marketing and financial principles to the planning and execution of retail management. Includes analyses of relevant institutions and interest groups. Prerequisites: MRKT 305 and ACCT 201; Sophomore or Junior Standing; declared CoBPA majors only. F.

**MRKT 325. International Marketing. 3 Credits.**

Survey of international business environment, with focus on elements of international marketing practices and their management. Prerequisites: MRKT 305; Sophomore, Junior or Senior Standing; declared CoBPA majors only. F,S.

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<td>MRKT 325</td>
<td>International Marketing</td>
<td>3</td>
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<td>MRKT 330</td>
<td>Marketing Research</td>
<td>3</td>
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<tr>
<td>MRKT 450</td>
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<td>Select five of the following*: 15</td>
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<tr>
<td>MRKT 311</td>
<td>Professional Selling</td>
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<tr>
<td>MRKT 315</td>
<td>Retail Management</td>
<td></td>
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<tr>
<td>MRKT 340</td>
<td>Integrated Marketing Communications</td>
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<tr>
<td>MRKT 386</td>
<td>Field Experience in Marketing</td>
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<td>MRKT 396</td>
<td>Directed Studies in Marketing</td>
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<td>MRKT 397</td>
<td>Cooperative Education in Marketing</td>
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<td>MRKT 405</td>
<td>Brand and Product Management</td>
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<td>MRKT 411</td>
<td>Sales Management</td>
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<tr>
<td>MRKT 433</td>
<td>Negotiations for Sales and Relationship Managements</td>
<td></td>
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<tr>
<td>MRKT 440</td>
<td>Special Topics in Marketing</td>
<td></td>
</tr>
<tr>
<td>MRKT 497</td>
<td>Internship in Marketing</td>
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</tbody>
</table>

**Total Credits**

Minimum of 82

* No more than a total of 3 credits from MRKT 386 Field Experience in Marketing; MRKT 396 Directed Studies in Marketing; MRKT 397 Cooperative Education in Marketing; and MRKT 497 Internship in Marketing may be used to satisfy this requirement.
MRKT 330. Marketing Research. 3 Credits.
The research process from a marketing perspective. Addresses problem formulation, research design, methodology, and appropriate statistical methods. Application of procedures appropriate for the analysis and interpretation of marketing data. Prerequisites: MRKT 305 and ECON 210; Sophomore, Junior or Senior Standing; declared CoBPA majors only. F.S.

MRKT 340. Integrated Marketing Communications. 3 Credits.
This course focuses on the state-of-the-art strategic concept of integrated marketing communication (IMC). IMC incorporates advertising, sales promotions, publicity, public relations, personal selling, Internet, and any other means by which marketing information is communicated to people. The course will involve a synthesis of the theoretical, practical, and social considerations of IMC. Prerequisite: MRKT 305. F.S.

MRKT 347. Social Media. 3 Credits.
This course is an in-depth look at social networks, social media platforms and online advertising to offer students an advantage in many positions involving marketing, consulting and brand management both on the buyer and seller side of social media. Prerequisite: MRKT 305; Junior or Senior Standing; declared CoBPA majors. F.S.SS.

MRKT 386. Field Experience in Marketing. 1-8 Credits.
Work opportunity to assist with marketing activities and understand the role of marketing for that company/organization (profit/nonprofit). Prerequisites: Minimum GPA of 2.5, MRKT 305, and consent of instructor. Repeatable to 8 credits. S/U grading. F.S.SS.

MRKT 396. Directed Studies in Marketing. 1-3 Credits.
Research in some aspect of marketing. Written reports and collateral readings. Prerequisites: MRKT 310 and consent of instructor. F.S.SS.

MRKT 397. Cooperative Education in Marketing. 1-2 Credits.
Compensated, on-the-job experience in various areas of marketing. Repeatable only to maximum of 8 credits. Prerequisites: MRKT 305 and consent of instructor. Repeatable to 8 credits. S/U grading. F.S.SS.

MRKT 405. Brand and Product Management. 3 Credits.
The study of the theory and practice of managing brands and products as vital corporate assets and the focus of the marketing planning process. Prerequisites: MRKT 310 and MRKT 330; Junior or Senior Standing; declared CoBPA majors only. S.

MRKT 411. Sales Management. 3 Credits.
The practice of sales management including sales force recruiting, training, organization, motivation, compensation, and evaluation. Prerequisites: MRKT 305 and MRKT 311; Junior or Senior Standing; declared CoBPA majors only. S.

MRKT 430. Relationship Marketing. 3 Credits.
Relationship marketing is now a core, strategic element of virtually all marketing. Organizations increasingly stress the importance of cooperation with customers, communities, charities, and other partners. This course focuses primarily on marketing relationships in the Organization-to-Organization context. Prerequisites: MRKT 305 and MRKT 311; Junior or Senior Standing; declared CoBPA majors only. S.

MRKT 433. Negotiations for Sales and Relationship Managements. 3 Credits.
The primary focus of this course is placed on the theoretical, practical and experiential learning of the negotiations skills. Emphasis is placed on the specific negotiations skills required to successfully maneuver through the negotiated buyer-seller exchange environment. Prerequisite: MRKT 311 or consent of instructor. S.

MRKT 440. Special Topics in Marketing. 3 Credits.
Investigation of selected topics of importance to the marketing of goods, services, or ideas. May be taken a maximum of two times for credit. Prerequisites: MRKT 305; Junior or Senior Standing; declared CoBPA majors only. Repeatable to 6 credits. S.

MRKT 450. Marketing Management. 3 Credits.
Capstone course addressing the firm's micro and macro environments from a strategic marketing decision making perspective. Prerequisites: MRKT 305, MRKT 310, MRKT 325 and MRKT 330; Senior Standing; declared CoBPA majors only. F.S.

MRKT 487. Internship in Marketing. 1-9 Credits.
Compensated, practical experience with selected participating firms. Repeatable only to maximum of 8 credits. Prerequisites: 9 hours of Marketing, GPA of 2.75, and consent of instructor. Repeatable to 8 credits. S/U grading. F.S.SS.

Mathematics (Math)

http://www.arts-sciences.und.edu/math

Bartz, Bevelacqua, Collings, Dearden, Dunigan (Chair), Halcrow, Hong, J. liams, M. liams (Director of Math Active Learning Lab), Khavanin, Millsapgh, Minnotte (Associate Chair), Peterson, Prescott, Richards, Takahashi and Zerr

The functions of the Mathematics Department within the total framework of the University are varied. Besides the training of undergraduate and graduate majors in the field of Mathematics, the Department offers courses designed to meet the needs of students in business; engineering; physical, social, and biological sciences; and elementary and secondary education.

The student considering mathematics as a career should realize that emphasis in mathematics courses will change as he/she progresses through college and graduate school. The early emphasis on solving problems is later subordinated to the more important tasks of formulating problems in mathematical language and of dealing effectively with mathematical structures and abstract ideas.

It should be stressed that an effective mathematician in any type of employment should be a well-educated person. He/she should have not only the technical background of calculus and differential equations taken by most scientists and engineers, and the more advanced mathematical training required for a major in mathematics, but should also have taken a selection of courses from other disciplines. A student who plans to continue beyond the bachelor's degree in mathematics should also acquire a reading knowledge of at least one and preferably two of the foreign languages in which much of the current literature in mathematics is written, namely, German, Russian, and French. All students should, of course, acquire fluency in the written and oral expression of ideas in English.

The main fields of opportunity in mathematics today are teaching, statistics, data analysis, consulting, information theory, and actuarial mathematics.

Students may pursue the B.S. degree with a major in mathematics through the College of Arts and Sciences. Secondary teacher licensure is possible when appropriate requirements are met.

Elective courses to be taken toward the bachelor's degree are decided in consultation with an adviser from the Mathematics Department, and vary according to the needs of the student, consistent with the particular objective of the general education and mathematical education of the student.

Placement in Mathematics. Appropriate initial enrollment in mathematics courses at UND is determined by a combination of entrance and placement tests or the acceptance of credits for transfer, Advanced Placement (AP) and College Level Examination Program (CLEP). Students enrolling without such previous credit are directed to entry level mathematics courses, courses numbered 092 through 165 and 277 depending on their scores on the ACT Mathematics test and/or a combination of scores on tests from the Placement Testing Protocol.

Anyone without the required prerequisites enrolling in a mathematics course may be dropped from the class by the instructor.

College of Arts and Sciences

B.S. with Major in Mathematics

All students are urged to take courses in disciplines which make use of mathematics such as Physics, Chemistry, Engineering, Computer Science and Biology. Students considering graduate school are strongly urged to take MATH 441 Abstract Algebra, and a full year of and MATH 432 Introduction to Analysis II.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

1. Mathematics (Math)
2. Sciences (Physics, Chemistry, etc.)
3. Humanities and Social Sciences
4. Electives

Secondary teacher licensure is possible when appropriate requirements are met.

Consultation with an adviser from the Mathematics Department, and vary according to the needs of the student, consistent with the particular objective of the general education and mathematical education of the student.

Placement in Mathematics. Appropriate initial enrollment in mathematics courses at UND is determined by a combination of entrance and placement tests or the acceptance of credits for transfer, Advanced Placement (AP) and College Level Examination Program (CLEP). Students enrolling without such previous credit are directed to entry level mathematics courses, courses numbered 092 through 165 and 277 depending on their scores on the ACT Mathematics test and/or a combination of scores on tests from the Placement Testing Protocol.

Anyone without the required prerequisites enrolling in a mathematics course may be dropped from the class by the instructor.

College of Arts and Sciences
I. Essential Studies Requirements (see University ES listing).

II. Non-Mathematics Requirements:

Three hours of Computer Science as approved by the Mathematics Department (see http://www.und.edu/dept/math/majinfo.html).

III. The Following Curriculum of 38 Major Hours:

A. Mathematics Core

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 165</td>
<td>3</td>
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<tr>
<td>&amp; MATH 166</td>
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<tr>
<td>&amp; MATH 265</td>
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<tr>
<td>MATH 207</td>
<td>2</td>
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<tr>
<td>MATH 266</td>
<td>3</td>
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<tr>
<td>MATH 488</td>
<td>3</td>
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<tr>
<td>Total Credits</td>
<td>20</td>
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B. Breadth Requirement

One course from each of the following areas (9)

1. Theoretical Mathematics: Courses where the emphasis is on development of theory from basic principles:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 330</td>
<td>3</td>
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<tr>
<td>MATH 403</td>
<td>3</td>
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<tr>
<td>MATH 405</td>
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<tr>
<td>MATH 409</td>
<td>3</td>
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<tr>
<td>MATH 431</td>
<td>3</td>
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<td>MATH 435</td>
<td>3</td>
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<tr>
<td>MATH 441</td>
<td>3</td>
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<td>MATH 442</td>
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</table>

2. Applications of Mathematics: Courses where the emphasis is on applications of mathematics:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 352</td>
<td>3</td>
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<tr>
<td>MATH 412</td>
<td>3</td>
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<tr>
<td>MATH 415</td>
<td>1-3</td>
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<tr>
<td>MATH 425</td>
<td>3</td>
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<tr>
<td>MATH 460</td>
<td>3</td>
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<tr>
<td>MATH 461</td>
<td>3</td>
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<tr>
<td>MATH 471</td>
<td>3</td>
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</table>

3. Probability and Statistics:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 321</td>
<td>3</td>
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<tr>
<td>MATH 403</td>
<td>3</td>
</tr>
<tr>
<td>MATH 416</td>
<td>1-3</td>
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<tr>
<td>MATH 421</td>
<td>3</td>
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</tbody>
</table>

C. Depth Requirement

Courses used to satisfy C may also be used to satisfy a portion of B.

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 352</td>
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<tr>
<td>&amp; MATH 412</td>
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<td>MATH 403</td>
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<td>&amp; MATH 416</td>
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<td>MATH 408</td>
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<td>&amp; MATH 425</td>
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<td>MATH 421</td>
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<td>&amp; MATH 422</td>
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<tr>
<td>MATH 431</td>
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<tr>
<td>&amp; MATH 432</td>
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</tbody>
</table>

D. Electives

Math courses numbered 208 and above, excluding MATH 277 Mathematics for Elementary School Teachers, MATH 377 Geometry Elementary Teachers, MATH 400 Methods for Teaching Middle and Secondary Mathematics, Pedagogical Content Knowledge, MATH 477 Topics in Elementary School Mathematics (3-9 to bring the total number of credits to 38)

Teacher Licensure

Through a partnership with the College of Education and Human Development and the Department of Teaching and Learning, students may seek secondary licensure in Mathematics. The following program of study must be completed:

I. Mathematics program of study

1. The Essential Studies, Non-Mathematics, and Mathematics Core requirements as described above.

2. The following courses to satisfy the breadth requirement:

   a. Theoretical Mathematics: MATH 330 Set Theory and Logic
   c. Teaching Content Requirements: MATH 208 Discrete Mathematics, MATH 308 History of Mathematics, MATH 409 Geometry

3. The following sequence:

   - MATH 435 Theory of Numbers & MATH 441 Abstract Algebra

II. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 615) for admission and licensing requirements.)

III. The program in Secondary Education (see Teaching & Learning (p. 241)):

Mathematics majors seeking secondary licensure must have an advisor in both the Mathematics Department and the Department of Teaching and Learning.

Minor in Mathematics

Required 20 credits as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 165</td>
<td>8</td>
</tr>
<tr>
<td>&amp; MATH 166</td>
<td></td>
</tr>
<tr>
<td>Math electives numbered 207 or higher</td>
<td>12</td>
</tr>
<tr>
<td>Total Credits</td>
<td>20</td>
</tr>
</tbody>
</table>

* not including MATH 217 Introduction to Cultural Mathematics.

Mathematics majors seeking secondary licensure must have an advisor in both the Mathematics Department and the Department of Teaching and Learning.

Minor in Mathematics for Elementary Education

Required 20 credits of Mathematics, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 115</td>
<td>3</td>
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<tr>
<td>MATH 277</td>
<td>3</td>
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<tr>
<td>MATH 377</td>
<td>3</td>
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<tr>
<td>MATH 477</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>20</td>
</tr>
</tbody>
</table>

Select at least one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 146</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>3</td>
</tr>
<tr>
<td>MATH 415</td>
<td>3</td>
</tr>
<tr>
<td>MATH 416</td>
<td>3</td>
</tr>
</tbody>
</table>
Minor in Statistics (Plan A)

**Prerequisites**
- MATH 165 Calculus I 4
- MATH 166 Calculus II 4
- MATH 265 Calculus III 4

**Required courses**
- MATH 421 Statistical Theory I 3
- MATH 422 Statistical Theory II 3

Select one of the following: 3
- BIOL 470 Biometry
- EFR 513 Large Dataset Analysis
- EFR 514 Discourse Analysis
- EFR 516 Statistics II
- CHE 515 Design of Engineering Experiments
- ECON 410 Empirical Methods in Economics I
- EE 411 Communications Engineering
- MATH 321 Applied Statistical Methods
- MATH 403 Theory of Probability
- MATH 415 Topics in Applied Mathematics
- MATH 416 Topics in Statistics
- PSYC 541 Advanced Univariate Statistics
- PSYC 542 Multivariate Statistics for Psychology
- PSYC 543 Experimental Design
- SOC 521 Advanced Analytical Methods

Total Credits 21

**Courses**

**MATH 92. Algebra Prep II. 2 Credits.**
This course continues the development of the fundamental skills required for the successful completion of studies in college-level mathematics courses. Topics include the solutions of linear equations and inequalities, formula manipulation, Cartesian geometry and the graphing of linear equations and inequalities, systems of equations, and an introduction to functions. Study skills will be incorporated throughout the course. Note: credit earned does not count toward any degree, nor does it transfer. Prerequisite: Placement by appropriate ACT Math sub-score or Math Placement Exam score. F,S,SS.

**MATH 93. Algebra Prep III. 2 Credits.**
This course continues the development of the fundamental skills required for the successful completion of studies in college-level mathematics courses. Topics include exponents and radicals, algebraic manipulation involving polynomial and rational forms, and unit analysis. Study skills will be incorporated throughout the course. Note: credit earned does not count towards any degree, nor does it transfer. Prerequisite: MATH 92 or Placement by appropriate ACT Math sub-score or Math Placement Exam score. F,S,SS.

**MATH 103. College Algebra. 3 Credits.**
Polynomial and rational functions, inverse functions, exponential and logarithmic functions, simple conics, systems of equations, determinants, arithmetic and geometric sequences, the Binomial Theorem. Sections meeting 5 days per week are offered for students determined eligible by the Math Department. Prerequisite: Appropriate score in the Placement Testing Program or MATH 93. F,S,SS.

**MATH 105. Trigonometry. 2 Credits.**
Angles, trigonometric functions and their inverses, solving triangles, trigonometric identities. Prerequisite: One year of high school geometry and either an appropriate score in the Placement Testing Program or MATH 93. S.

**MATH 107. Precalculus. 4 Credits.**
Equations and inequalities; polynomial, rational, exponential, logarithmic and trigonometric functions; inverse trigonometric functions; algebraic and trigonometric methods commonly needed in calculus. Prerequisite: MATH 93 or an appropriate score in the Placement Testing Program. F,S,SS.

**MATH 112. Transition to Calculus. 1 Credit.**
This course is designed for students intending to take MATH 165, Calculus I who have mastered most of, but not all, the material covered in MATH 107. Pre-Calculus. Emphasis is therefore on topics such as inverse functions, partial fraction expansion, trigonometric identities, and applications of trigonometry, which are deemed most difficult for pre-calculus students. Prerequisite: MATH 107 or MATH 146 or an appropriate score in the Placement Testing Program. S/U grading. F.

**MATH 115. Introduction to Mathematical Thought. 3 Credits.**
The course will focus on analysis and interpretation of common types of mathematical arguments as well as having students construct their own arguments. A combination of topics will be included, such as: elementary combinatorics, probability, statistics, set theory, number theory, geometry and topology, mathematical logic, the mathematics of voting, etc. F.

**MATH 146. Applied Calculus I. 3 Credits.**
A nonrigorous introduction to differential and integral calculus. Topics include limits, continuity, differentiation and integration techniques, and applications. Prerequisites: MATH 103 or an appropriate score in the Placement Testing Program. F,S,SS.

**MATH 165. Calculus I. 4 Credits.**
Limits, continuity, differentiation, Mean Value Theorem, integration, Fundamental Theorem of Calculus. Prerequisite: an appropriate score in the Placement Testing Program or MATH 112 or completion of MATH 107 with a grade of C or better. F,S,SS.

**MATH 166. Calculus II. 4 Credits.**
Techniques and applications of integration, exponential and logarithmic functions, parametric equations, infinite sequences and series. Prerequisites: Completion of MATH 165 with a grade of C or better; or permission of the Mathematics Department. F,S,SS.

**MATH 207. Introduction to Linear Algebra. 2 Credits.**
A computational treatment of systems of linear equations, finite dimensional vector spaces, linear transformations, determinants, matrices, eigenvalues, eigenvectors, and diagonalizability. Prerequisite: MATH 165. F,S.

**Minor in Statistics (Plan B)**

**Prerequisites**
- MATH 146 Applied Calculus I 3

**Required courses**
- BIOL 470 Biometry 4
- EFR 513 Large Dataset Analysis 3
- EFR 514 Discourse Analysis 3
- EFR 516 Statistics II 3
- CHE 515 Design of Engineering Experiments 3

Select one of the following: 3
- ECON 210 Introduction to Business and Economic Statistics
- PSYC 241 Introduction to Statistics
- SOC 326 Sociological Statistics
- ECON 410 Empirical Methods in Economics I
- EE 411 Communications Engineering
- MATH 321 Applied Statistical Methods
- MATH 403 Theory of Probability
- MATH 415 Topics in Applied Mathematics
- MATH 416 Topics in Statistics
- PSYC 541 Advanced Univariate Statistics
- PSYC 542 Multivariate Statistics for Psychology
- PSYC 543 Experimental Design
- SOC 521 Advanced Analytical Methods

Total Credits 22

**NOTE:** PTP* indicates an appropriate score in the Placement Testing Program (PTP) is required.
MATH 208. Discrete Mathematics. 3 Credits.
Introduction to Set Theory, Functions and Relations, Permutations and Combinations, Logic, Boolean Algebra, Induction, Difference Equations. Other topics from Graphs, Finite Automata and Formal Languages. Prerequisite: an appropriate score in the Placement Testing Program or MATH 103 or MATH 107. F,S,SS.

MATH 217. Introduction to Cultural Mathematics. 3 Credits.
This course covers mathematical concepts within the context of cultures. Mathematical ideas are investigated in topics such as number systems, calendars, art, kinship relations, divination, and games. Examples are taken from cultures in many parts of the world. The main emphasis in the course is on learning how cultural activities can be considered mathematical and often include non-trivial mathematical ideas. One or more case studies of particular cultures will also be included. The case studies will consist of investigations into several cultural aspects that have mathematical connections. Prerequisite: A grade of C or better in MATH 103. S, odd years.

MATH 265. Calculus III. 4 Credits.
Multivariate and vector calculus including partial derivatives, multiple integration, line and surface integrals, Green's Theorem, Stokes' Theorem, the Divergence Theorem. Prerequisite: MATH 166. F,S,SS.

MATH 266. Elementary Differential Equations. 3 Credits.
Solution of elementary differential equations by elementary techniques. Laplace transforms, introduction to matrix theory and systems of differential equations. Prerequisites: MATH 265 and proficiency in a programming language. F,S,SS.

MATH 277. Mathematics for Elementary School Teachers. 3 Credits.
Development of the number systems used in elementary schools. Includes some methods and work with laboratory materials. For elementary education majors only. Prerequisites: Admission to Teacher Education and either an appropriate score in the Placement Testing Program or MATH 103. F,S.

MATH 308. History of Mathematics. 3 Credits.
This is a course on the conceptual and chronological history of mathematics. The course involves the interpretation and analysis of how and why mathematical ideas developed. It includes political and cultural considerations. Topics include: numbers and counting systems, non-Western developments, mathematics of Egypt, Babylonia and Greece, early European developments, the Renaissance, the Scientific Revolution and the development of calculus, women in mathematics, twentieth century mathematics. Prerequisite: MATH 166 or equivalent, or consent of instructor. S.

MATH 315. Topics in Computational Mathematics. 1-3 Credits.
An introduction to mathematical methods useful in the computational analysis of problems in applied mathematics. Topics may include numerical methods, numerical simulation, symbolic computation, and theory of computation. May be repeated for credit with consent of instructor up to six credits. Prerequisites: MATH 266 and proficiency in a programming language, or consent of instructor. Repeatable to 6 credits. On demand.

MATH 321. Applied Statistical Methods. 3 Credits.
Basic topics of ordinary differential equations. Existence and uniqueness of solutions. Prerequisite: MATH 266. F, odd years.

MATH 399. Methods for Secondary Teachers: Mathematical Content Knowledge. 3 Credits.

MATH 400. Methods for Teaching Middle and Secondary Mathematics; Pedagogical Content Knowledge. 3 Credits.

MATH 403. Theory of Probability. 3 Credits.
Sets, sample spaces, discrete probability, distribution functions, density functions, characteristic functions, study of normal, Poisson, binomial and other distributions with applications. Prerequisite: MATH 265. S, odd years.

MATH 405. Selected Topics in Mathematics. 1-3 Credits.
May be repeated to maximum of six credits. Prerequisite: Permission of the Mathematics Department. Repeatable to 6 credits. On demand.

MATH 408. Combinatorics. 3 Credits.
Introduction to the techniques and reasoning needed in combinatorial problem-solving. The course may include topics related to combinatorics, such as graph theory. Prerequisites: MATH 166 and MATH 208. S.

MATH 409. Geometry. 3 Credits.
Metric and synthetic approach to Euclidean geometry. The usual topics in elementary geometry treated in a mathematically logical way. Topics include congruence, inequalities, parallelism, similarity, area, solid geometry and the circle. Prerequisite: MATH 208 or MATH 330. F.

MATH 412. Differential Equations. 3 Credits.
Basic topics of ordinary differential equations. Existence and uniqueness of solutions. Prerequisite: MATH 266. F, odd years.

MATH 415. Topics in Applied Mathematics. 1-3 Credits.
An introduction to selected areas in applied mathematics chosen from a variety of topics including: Applied algebra, difference equations, linear programming, modeling and simulation, operations research, optimization, partial differential equations and computers in mathematics. Topics to be considered will be illustrated with examples and practical applications. May be repeated for credit with consent of instructor up to a maximum of six credits. Prerequisites: MATH 265 and consent of instructor. Repeatable to 6 credits. On demand.

MATH 416. Topics in Statistics. 1-3 Credits.
An introduction to a variety of topics in statistics including: Linear models in categorical analysis, Bayesian methods, decision theory, ridge regression, Non parametric techniques, stochastic games and models. The number of topics to be considered during a semester will be limited to permit greater depth of coverage and sufficient practical illustrations. May be repeated for credit with consent of instructor up to six credits. Prerequisites: MATH 265 and MATH 321 or consent of instructor. Repeatable to 6 credits. On demand.

MATH 421. Statistical Theory I. 3 Credits.
Discrete and continuous random variables, expectation, moments, moment generating functions, properties of special distributions, introduction to hypothesis testing, sampling distributions, Central Limit Theorem, curve of regression, correlation, empirical regression by least squares, maximum likelihood estimation, Neyman-Pearson lemma, likelihood ratio test, power function, chi-square tests, change of variable, "t" and "F" tests, one and two- way ANOVA, nonparametric methods. Prerequisite: MATH 265. F.

MATH 422. Statistical Theory II. 3 Credits.
Discrete and continuous random variables, expectation, moments, moment generating functions, properties of special distributions, introduction to hypothesis testing, sampling distributions, Central Limit Theorem, curve of regression, correlation, empirical regression by least squares, maximum likelihood estimation, Neyman-Pearson lemma, likelihood ratio test, power function, chi-square tests, change of variable, "t" and "F" tests, one and two- way ANOVA, nonparametric methods. Prerequisite: MATH 265. S.

MATH 425. Cryptological Mathematics. 3 Credits.
This course develops the math behind elementary symmetric-key ciphers and a variety of public-key schemes. Modern block ciphers may be discussed. Prerequisite: MATH 208. F, odd years.
MATH 431. Introduction to Analysis I. 3 Credits.
Development of the real number system, functions, sequences, limits, continuity, and differentiation. Prerequisite: MATH 330 or consent of instructor. F.

MATH 432. Introduction to Analysis II. 3 Credits.
A continuation of MATH 431. Topics in the second semester include integration, partial differentiation, infinite series, power series and vector analysis. Prerequisite: MATH 431. S.

MATH 435. Theory of Numbers. 3 Credits.
Basic properties of numbers, including divisibility, primes, congruences, Diophantine equations and residue theory. Prerequisite: MATH 208 or 330. S.

MATH 441. Abstract Algebra. 3 Credits.
Rings, integral domains, fields, elements of group theory. Prerequisite: MATH 330 or consent of instructor. F.

MATH 442. Linear Algebra. 3 Credits.
A theoretical treatment of systems of linear equations, matrices, vector spaces, linear transformations and elementary canonical forms. Prerequisites: MATH 207 and MATH 330 or consent of instructor. S.

MATH 460. Mathematical Modeling. 3 Credits.
The primary goal of the course is to present the mathematical analysis provided in scientific modeling. Topics may include population modeling, mechanical vibrations, traffic flow, epidemic modeling, queues and decay processes. Prerequisites: MATH 266 and MATH 207 or consent of instructor. F, even years.

MATH 461. Numerical Analysis. 3 Credits.
Numerical techniques for: the solution of equations in one or several unknowns, approximate integration, differential equations, approximation theory, optimization theory and matrix analysis. Corresponding error analysis will be investigated. Prerequisites: MATH 266 and a scientific programming language. F, odd years.

MATH 471. Introduction to Complex Variables. 3 Credits.
The complex plane, analytic functions, complex integration, power series, the theory of residues and contour integration, conformal mapping, Fourier and Laplace transformations, and applications. Prerequisite: MATH 265. F, even years.

MATH 477. Topics in Elementary School Mathematics. 1-3 Credits.
Selected topics from mathematical concepts appropriate to the elementary school curriculum. May be repeated for credit up to six credits. Prerequisite: Elementary education majors only. Repeatable to 6 credits. On demand.

MATH 479. Topics in Mathematics Education. 1-3 Credits.
Selected topics from mathematical concepts appropriate for K-12 educators. May be repeated for up to six credits. Prerequisite: Instructor consent. Repeatable to 6 credits. On demand.

MATH 488. Senior Capstone. 3 Credits.
This course is designed to help students transition into working mathematicians. Thus the course will address 1) written and oral expression of mathematical material and concepts, 2) research and problem solving in mathematics, and 3) technology in mathematics, and its appropriate use. Material will build on the core areas of calculus, linear algebra, and differential equations. Prerequisites: Senior standing with a major in mathematics. F.

MATH 494. Reading Course in Mathematics. 1-3 Credits.
Directed individual reading on selected topics not developed in other courses. Repeatable to six credits. Prerequisites: Consent of instructor. Repeatable to 6 credits. F, S, SS.

MATH 495. Readings in Mathematics. 1-3 Credits.
Directed individual reading on selected topics not developed in other courses. Repeatable to six credits. Prerequisite: Consent of instructor. Repeatable to 6 credits. F, S, SS.

Mechanical Engineering (ME)

http://engineering.und.edu/mechanical/
Ames, Bibel, Cavalli, Grewal, Gupta, Haghighenas, Letvin, McNally, Neubert, Sandip, Semke (Chair), Stanlake, Tang, Yang and Zahui

The Mechanical Engineering Department prepares students at all levels to effectively apply modern engineering principles to the evolving needs of industry and society through focused efforts in manufacturing, materials science, mechanical design, thermal sciences, and aerospace applications. The Department supports an accessible, collaborative, multidisciplinary research and learning environment that stimulates students and faculty members to reach their highest potential through hands-on education, leadership opportunities, and life-long learning.

The Mechanical Engineering Department at the University of North Dakota is committed to graduating mechanical engineers who will:

1. Successfully practice mechanical engineering in the areas of mechanical design, thermal systems, and manufacturing and materials in industry and government settings;
2. Practice mechanical engineering across a broad range of job functions from detailed design to laboratory experimentation to engineering management;
3. Practice engineering alone or as part of a larger team, demonstrating the appropriate teamwork, leadership and communication skills for each professional situation;
4. Apply the highest standards of professional and ethical conduct, understanding the broader implications of their engineering efforts on local, national and global society;
5. Maintain relevant knowledge of contemporary engineering and professional issues and an understanding of modern engineering tools through regular participation in professional development activities.

Continuous assessment of student learning in accordance with specific program outcomes, including input from program constituents such as students, alumni, employers and industry advisory groups, provides opportunity to measure success in meeting the mission of the department. Beginning with the freshman year, teamwork, problem solving, and design exercises are interwoven throughout the curriculum, culminating in a two-semester capstone design project during the senior year. Several courses include laboratories which develop experimental, teamwork, and communication skills. Technical papers required by selected courses develop knowledge of contemporary issues as well as communication skills. State-of-the-art computer software is used extensively throughout the curriculum. Within our bachelor’s degree we offer an Aerospace Concentration. This option adds five credits to the degree but results in the student earning a private pilot’s license as well as tailoring the engineering degree towards the aerospace industry. Students already possessing a private pilot’s license (or equivalent) may waive this requirement. Three other concentrations are also available: Mechanical Design; Thermal Sciences; and Materials and Manufacturing. Students are strongly encouraged to prepare for professional licensure by taking the Fundamentals of Engineering (FE) exam prior to graduation. Students who excel academically are also well-qualified to pursue graduate work in mechanical engineering or a related field.

The department offers combined Bachelor of Science in Mechanical Engineering (BSME)/Master of Science in Mechanical Engineering (MSME) and BSME/Master of Engineering (MEng) degrees. For more detailed information, see Mechanical Engineering in the Graduate Section and Combined Degree Program under the College of Engineering and Mines (p. 618) section.

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET (www.ABET.org).

In addition to the normal transfer credit requirements, students in Mechanical Engineering must complete a minimum of 21 credit hours of 300-level or higher coursework in Mechanical Engineering at UND, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 418</td>
<td>Manufacturing Processes</td>
<td>4</td>
</tr>
<tr>
<td>ME 483</td>
<td>Mechanical Measurements Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ME 487</td>
<td>Engineering Design</td>
<td>5</td>
</tr>
<tr>
<td>ME 488 &amp; ME 488</td>
<td>Engineering Design</td>
<td>5</td>
</tr>
</tbody>
</table>

College of Engineering and Mines

B.S. in Mechanical Engineering

Required 129 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).
II. The Following Curriculum:

### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121</td>
<td>3</td>
</tr>
<tr>
<td>General Chemistry I</td>
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<tr>
<td>CHEM 121L</td>
<td>1</td>
</tr>
<tr>
<td>General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>College Composition I</td>
<td></td>
</tr>
<tr>
<td>ME 101</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>MATH 165</td>
<td>4</td>
</tr>
<tr>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>17</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 200</td>
<td>2</td>
</tr>
<tr>
<td>Computer Applications in Engineering</td>
<td></td>
</tr>
<tr>
<td>ENGL 130</td>
<td>4</td>
</tr>
<tr>
<td>Composition II: Writing for Public Audiences</td>
<td></td>
</tr>
<tr>
<td>MATH 166</td>
<td>4</td>
</tr>
<tr>
<td>Calculus II</td>
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</tr>
<tr>
<td>PHYS 251</td>
<td>4</td>
</tr>
<tr>
<td>University Physics I</td>
<td></td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
</tr>
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</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 201</td>
<td>3</td>
</tr>
<tr>
<td>Statics</td>
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</tr>
<tr>
<td>ME 201</td>
<td>2</td>
</tr>
<tr>
<td>Student Design</td>
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</tr>
<tr>
<td>ME 341</td>
<td>3</td>
</tr>
<tr>
<td>Thermodynamics</td>
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</tr>
<tr>
<td>MATH 265</td>
<td>4</td>
</tr>
<tr>
<td>Calculus III</td>
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<tr>
<td>PHYS 252</td>
<td>4</td>
</tr>
<tr>
<td>University Physics II</td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGR 202</td>
<td>3</td>
</tr>
<tr>
<td>Dynamics</td>
<td></td>
</tr>
<tr>
<td>ENGR 203</td>
<td>3</td>
</tr>
<tr>
<td>Mechanics of Materials</td>
<td></td>
</tr>
<tr>
<td>ENGR 206</td>
<td>3</td>
</tr>
<tr>
<td>Fundamentals of Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td>MATH 266</td>
<td>3</td>
</tr>
<tr>
<td>Elementary Differential Equations</td>
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</tr>
<tr>
<td>PHYS 253 or CHEM 122L</td>
<td>4</td>
</tr>
<tr>
<td>University Physics III</td>
<td></td>
</tr>
<tr>
<td>or General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>Credits</td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 301</td>
<td>3</td>
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<tr>
<td>Materials Science</td>
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</tr>
<tr>
<td>ME 306</td>
<td>3</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td></td>
</tr>
<tr>
<td>ME 322</td>
<td>3</td>
</tr>
<tr>
<td>Design of Machinery</td>
<td></td>
</tr>
<tr>
<td>ENGR 460</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Economy</td>
<td></td>
</tr>
<tr>
<td>Technical Elective</td>
<td>4</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ME 323</td>
<td>3</td>
</tr>
<tr>
<td>Machine Component Design</td>
<td></td>
</tr>
<tr>
<td>ME 323L</td>
<td>1</td>
</tr>
<tr>
<td>Machine Component Design Laboratory</td>
<td></td>
</tr>
<tr>
<td>ME 418</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing Processes</td>
<td></td>
</tr>
<tr>
<td>ME 474</td>
<td>3</td>
</tr>
<tr>
<td>Fundamentals of Heat and Mass Transfer</td>
<td></td>
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<tr>
<td>MATH 321</td>
<td>3</td>
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<tr>
<td>Applied Statistical Methods</td>
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</tr>
<tr>
<td>Technical Elective</td>
<td>4</td>
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<tr>
<td>Credits</td>
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### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ME 480</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering Seminar</td>
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<tr>
<td>ME 483</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Measurements Laboratory</td>
<td></td>
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<tr>
<td>ME 487</td>
<td>2</td>
</tr>
<tr>
<td>Engineering Design</td>
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<tr>
<td>Social Science</td>
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<tr>
<td>Technical Electives</td>
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<tr>
<td>Credits</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 488</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Design</td>
<td></td>
</tr>
<tr>
<td>ME 370 or CHE 340 or PHIL 250</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Disasters and Ethics</td>
<td></td>
</tr>
<tr>
<td>or Professional Integrity in Engineering or Ethics in Engineering and Science</td>
<td></td>
</tr>
<tr>
<td>Arts &amp; Humanities (if taking either ME 370 or ChE 340) or Social Science (if taking Phil 250)</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>4</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
</tbody>
</table>

**Total Credits: 129**

### Technical Electives and Optional Concentrations

One technical elective must be taken from each stem unless the student is pursuing the Aerospace Concentration (see below). Students may receive an optional concentration, documented on the transcript, in one of the listed stems as indicated. Students who satisfactorily complete two full-time (40 hours/wk) or three part-time (20 hours+/wk) ME 397 Cooperative Education experiences for a combined total of at least three credit hours are granted a waiver for one technical elective, provided one of the Cooperative Education experiences lasts for the duration of either a fall or spring semester. The waived technical elective is considered as elective at large and is not specified into any one of the three stems listed below.

#### I. Mechanical Design Stem

- ME 424 Systems Dynamics and Control (#) | 3
- ME 426 Mechanical Vibrations (#) | 3
- ME 429 Introduction to Finite Element Analysis (#) | 3
- ME 439 Introduction to Robotics | 3
- ME 484 Ground Vehicle Dynamics | 3
- ME 485 Multiphysics Modeling | 3
- ME 523 Advanced Machine Design (#) | 3
- ME 525 Metal Fatigue in Engineering (#) | 3
- ME 526 Advanced Vibrations (#) | 3
- ME 529 Advanced Finite Element Methods (#) | 3
- ME 532 Advanced Dynamics (#) | 3

**Mechanical Design Concentration - 129 hours**

Requires ME 323 Machine Component Design/ME 323L Machine Component Design Laboratory and any four of the Mechanical Design Stem technical electives.

#### II. Thermal Sciences Stem

- ME 342 Intermediate Thermodynamics (#) | 3
- ME 446 Gas Turbines (#) | 3
- ME 449 Internal Combustion Engines (#) | 3
- ME 451 Heating and Air Conditioning | 3
- ME 464 Computational Fluid Dynamics (#) | 3
- ME 476 Intermediate Fluid Mechanics (#) | 3
- ME 477 Compressible Fluid Flow (#) | 3
- ME 485 Multiphysics Modeling | 3
- ME 542 Thermodynamics of Materials | 3
- ME 545 Fluidized-Bed Combustion Engineering | 3
- ME 574 Advanced Heat Transfer (#) | 3
- ME 575 Conduction and Radiation Heat Transfer (#) | 3
- ME 576 Convective Heat Transfer (#) | 3

**Thermal Sciences Concentration - 129 hours**

Requires ME 306 Fluid Mechanics, ME 341 Thermodynamics and any four of the Thermal Sciences Stem technical electives.

#### III. Manufacturing and Materials Stem

- ME 313 Material Properties and Selection | 3
- ME 420 Composite Materials (#) | 3
- ME 428 Advanced Manufacturing Processes | 3

Requires ME 306 Fluid Mechanics, ME 341 Thermodynamics and any four of the Thermal Sciences Stem technical electives.

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**Technical Electives and Optional Concentrations**

One technical elective must be taken from each stem unless the student is pursuing the Aerospace Concentration (see below). Students may receive an optional concentration, documented on the transcript, in one of the listed stems as indicated. Students who satisfactorily complete two full-time (40 hours/wk) or three part-time (20 hours+/wk) ME 397 Cooperative Education experiences for a combined total of at least three credit hours are granted a waiver for one technical elective, provided one of the Cooperative Education experiences lasts for the duration of either a fall or spring semester. The waived technical elective is considered as elective at large and is not specified into any one of the three stems listed below.

**Mechanical Design Concentration - 129 hours**

Requires ME 323 Machine Component Design/ME 323L Machine Component Design Laboratory and any four of the Mechanical Design Stem technical electives.

**Thermal Sciences Concentration - 129 hours**

Requires ME 306 Fluid Mechanics, ME 341 Thermodynamics and any four of the Thermal Sciences Stem technical electives.

**Manufacturing and Materials Concentration - 129 hours**

Requires ME 306 Fluid Mechanics, ME 341 Thermodynamics and any four of the Thermal Sciences Stem technical electives.
ME 439  Introduction to Robotics  3
ME 524  Deformation and Fracture (#)  3
ME 525  Metal Fatigue in Engineering (#)  3
ME 542  Thermodynamics of Materials  3

Manufacturing and Materials Concentration - 129 hours

Requires ME 418 Manufacturing Processes and any four of the Manufacturing and Materials Stem technical electives.

IV. Aerospace Concentration - 134 hours

Requires students to complete AVIT 102 Introduction to Aviation (5 credits) plus six technical electives. AVIT 102 Introduction to Aviation includes earning a private pilot license and is recommended for the summer session between the freshman and sophomore years.

Technical electives must be chosen from the aerospace group of electives as identified by # in the above technical elective listing. One of the technical electives must be either ME 429 Introduction to Finite Element Analysis or ME 464 Computational Fluid Dynamics. ME 490 Special Laboratory Problems or an ME 690 Special Topics may also be included in the aerospace group at the discretion of the Mechanical Engineering Chair.

1 Students must achieve a grade of "C" or better.
2 ME 101 Introduction to Mechanical Engineering, ME 201 Student Design, ENGR 200 Computer Applications in Engineering and ME 397 Cooperative Education may be waived by successful completion of ME 102 Professional Assessment and Evaluation. The ethics requirement as represented by ME 370 Engineering Disasters and Ethics/CHE 340 Professional Integrity in Engineering/PHIL 250 Ethics in Engineering and Science may also be waived, but not the University’s Essential Studies Requirements.
3 Another lab science may be substituted for PHYS 253 University Physics III or CHEM 122 General Chemistry II, consistent with the student’s individual learning plan, by petition to the ME Department.
4 One technical elective can be taken outside the ME Department within other CEM Departments, Math or Physics. The course must be at the 300-level or higher and be consistent with the student’s individual learning plan.
5 An alternative calculus-based statistics course may be substituted for MATH 321 with approval of the ME Department.
6 Students already holding a private pilot license may provide proof of this certification to the ME Department as a substitute for AVIT 102 Introduction to Aviation.

Courses

ME 101. Introduction to Mechanical Engineering. 3 Credits.
This course encourages the development of visualization, technical communication, documentation, and fabrication skills including 3-D geometric modeling as applied to CADD applications using current methods and techniques commonly found in industry. Students will receive an introduction to engineering design and the analysis of a machine or system, including team problem solving. Approximately two-thirds of the course is classroom-based instruction and one third is laboratory (computer lab and/or shop) instruction and experimentation. Prerequisites: Mechanical Engineering major. F.S.

ME 102. Professional Assessment and Evaluation. 1 Credit.
This course is designed for students with industrial experience. Students complete a portfolio documenting educational and work experiences for evaluation, and individualized curriculum plans are developed. Various cademic programs in engineering are also introduced. Based on the assessment and evaluation, some engineering requirements may be waived. S/U grading only. Prerequisites: Work experience and/or technician school plus completion of CHEM 121, CHEM 121L, PHYS 251, PHYS 252, MATH 165, MATH 166, and MATH 265. S/U grading. F.S,SS.

ME 201. Student Design. 2 Credits.
Team problem solving with design and build of a machine or mechanism, typically ASME Design Contest project. Machine shop safety and introduction to fabrication processes. Special topic lectures on contemporary Mechanical Engineering issues and research activities. Prerequisite: ME 101 or ENGR 101. Corequisites: PHYS 251 or ENGR 201. F.

ME 290. Laboratory Problems. 1-3 Credits.
Laboratory investigations of interest to student and faculty. Repeatable to a maximum of 6 credits. Prerequisite: Consent of instructor. Repeatable to 6 credits. On demand.

ME 301. Materials Science. 3 Credits.
The theory of the structure of matter, the prediction and evaluation of engineering properties of materials. Prerequisites: CHEM 121 with a grade of C or better, PHYS 252 with a grade of C or better, and admission to the professional Mechanical Engineering program. F.

ME 306. Fluid Mechanics. 3 Credits.
Fluid properties; fluid statics and dynamics; transport theory and transport analogies, conservation of mass, energy, and momentum; dimensional analysis; boundary layer concepts; pipe flows; compressible flow; open channel flow. Prerequisites: PHYS 251 and MATH 265, both with a grade of C or better. F.S.

ME 313. Material Properties and Selection. 3 Credits.
Study of relationships between materials, manufacture and design of engineering component. Prerequisite: ME 301 and admission to the professional Mechanical Engineering program. On demand.

ME 322. Design of Machinery. 3 Credits.
Analytical study of motions, velocities, accelerations and forces for design of machine elements. Introduction to spatial mechanisms, robotics, and actuator selection. Prerequisites: ENGR 200 with a grade of C or better, ENGR 202 with a grade of C or better, and admission to the professional Mechanical Engineering program. F.

ME 323. Machine Component Design. 3 Credits.
Design of machine elements such as shafts, bearings, gears, clutches, springs, threaded components, and bolted, riveted, welded, and bonded joints. Stress and failure theory analyses of the implementation of machine components are covered. Prerequisites: ENGR 203 with a grade of C or better, ME 322, and admission to the professional Mechanical Engineering program. S.

ME 323L. Machine Component Design Laboratory. 1 Credit.
Application of design and analysis tools developed in the Machine Component Design course. Laboratory emphasizes creative design, analysis techniques, construction methods, and design report writing. Prerequisite: Admission to the professional Mechanical Engineering program. Corequisite: ME 323. S.

ME 341. Thermodynamics. 3 Credits.
Fundamental energy relationships applied to both closed and open systems. Determination of thermodynamic properties, first and second laws of thermodynamic processes and basic cycles. Prerequisites: PHYS 251 and MATH 166, both with a grade of C or better. F.S.

ME 342. Intermediate Thermodynamics. 3 Credits.
Power and refrigeration cycles. Exergy analysis, psychrometrics, reacting and non-reacting mixtures. Prerequisite: ME 341 with a grade of C or better and admission to the professional Mechanical Engineering program. On demand.

ME 370. Engineering Disasters and Ethics. 3 Credits.
Engineering disasters will be the basis for teaching an ethics course to engineering students. Starting with the premise that most people know the difference between right and wrong (this is not a course on criminal activity!), the course explores how engineers, in spite of their best intentions, sometimes create disastrous situations. The effect of cumulative adverse detail is difficult to teach except with case studies. Also explored is cost vs. safety trade-offs, the role of lawsuits, and government regulation. Prerequisites: Junior or Senior standing. F.

ME 388. Undergraduate Research in Mechanical Engineering. 3 Credits.
Students will conduct a supervised independent study in a research lab or as part of a design team culminating in a research report. Prerequisite: Approval from department chair and faculty sponsor. S.

ME 397. Cooperative Education. 1-2 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department and employer. Repeatable to 12 credits. Prerequisite: Admission to the professional Mechanical Engineering program. Repeatable to 12 credits. S/U grading. F.S,SS.

ME 418. Manufacturing Processes. 4 Credits.
Descriptive and analytical study of manufacturing methods and economics as they pertain to machining, metrology and automation. Includes laboratory. Prerequisites: ENGR 203 with a grade of C or better, ME 301, and admission to the professional Mechanical Engineering program. F.
ME 420. Composite Materials. 3 Credits.
Prerequisites: ME 301 and admission to the professional Mechanical Engineering program. On demand.

ME 424. Systems Dynamics and Control. 3 Credits.
Theory, analysis, and design of linear closed-loop control systems containing electronic, hydraulic, and mechanical components. Differential equations, LaPlace transforms, Nyquist and Bode diagrams are covered. Prerequisites: MATH 266, ME 322, and admission to the professional Mechanical Engineering program. On demand.

ME 426. Mechanical Vibrations. 3 Credits.
Vibration analysis and design as it applies to single and multi degree freedom mechanical systems, isolation and absorption of vibration, vibration of continuous systems, numerical methods of solution. Prerequisites: ENGR 202 with a grade of C or better, MATH 266, and admission to the professional Mechanical Engineering program. S.

ME 428. Advanced Manufacturing Processes. 3 Credits.
Individual projects involving the manufacturing economics and flow charts for selected products and basic technical principles of manufacturing processes. Includes laboratory. Prerequisites: ME 418 and admission to the professional Mechanical Engineering program. On demand.

ME 429. Introduction to Finite Element Analysis. 3 Credits.
Finite element analysis is introduced as a design tool. Emphasis is given to modeling techniques and element types. Matrix methods are used throughout the class. Prerequisites: ENGR 202 with a grade of C or better, MATH 266, and admission to the professional Mechanical Engineering program. On demand.

ME 439. Introduction to Robotics. 3 Credits.
A systems engineering approach to robotics. Presents an introduction to manipulators, sensors, actuators, and end effectors for automation. Topics covered include kinematics, dynamics, control, programming of manipulators, pattern recognition, and computer vision. Prerequisites: ENGR 202 with a grade of C or better, MATH 266, and admission to the professional Mechanical Engineering program. On demand.

ME 446. Gas Turbines. 3 Credits.
General principles, thermodynamics, and performance of gas turbine engines. Design consideration of engine components. Prerequisites: ME 341 with a grade of C or better and admission to the professional Mechanical Engineering program. On demand.

ME 449. Internal Combustion Engines. 3 Credits.
Fundamentals of spark ignition and compression ignition engines, related components and processes. Prerequisites: ME 342 and admission to the professional Mechanical Engineering program. On demand.

ME 451. Heating and Air Conditioning. 3 Credits.
Psychrometrics, heating and cooling loads and analysis of air conditioning systems. Prerequisites: ME 342 and admission to the professional Mechanical Engineering program or consent of instructor. Corequisite: ME 474. On demand.

ME 464. Computational Fluid Dynamics. 3 Credits.
Provides a practical experience using computational fluid dynamics and provides supporting material in fluid dynamics, which is useful in understanding the need to resolve grids in boundary layers and other regions of high velocity gradients. The course is structured as half lecture and half laboratory. The lecture covers topics related to laminar and turbulence boundary layers with and without acceleration, turbulence modeling, wakes and jets. The laboratory provides experience in building grids using the program GAMBIT, the solid/fluid modeling and meshing program, and calculating solutions using FLUENT, a commercial flow solver. Prerequisites: ME 306, MATH 266, and admission to the professional Mechanical Engineering program. On demand.

ME 466. Aerodynamics. 3 Credits.
ME 466 Aerodynamics is an introductory course on the fundamentals of aerodynamics for engineers. The class will cover a review of fluid mechanics including boundary layers and compressible flow. The course includes topics parameters for airfoil and wings, incompressible flow over airfoils and wings of infinite and finite span, compressible and transonic flow over wings and aircraft, supersonic flow over thin airfoils, and supersonic flow over wings and airplane configurations. The course will follow a standard text "Aerodynamics for Engineers," 6th Edition by Bertin and Cummings. The course will qualify as either a thermal fluid science elective or an aerospace concentration elective. Prerequisites: ME 306 and ME 341. S. odd years.

ME 474. Fundamentals of Heat and Mass Transfer. 3 Credits.
Convection, conduction, radiation, dimensional analysis and design of heat transfer equipment. Prerequisites: MATH 266, ME 306, ME 341 with a grade of C or better, and admission to the professional Mechanical Engineering program. S.

ME 476. Intermediate Fluid Mechanics. 3 Credits.

ME 477. Compressible Fluid Flow. 3 Credits.
Introduction to the theory and application of one-dimensional compressible flow. Course topics include isentropic flow in converging and diverging nozzles, normal shock waves, oblique shock waves, Prandtl-Meyer flow, flow with friction and heat addition. Prerequisite: Admission to the professional Mechanical Engineering program. Prerequisites or Corequisites: ME 341 with a grade of C or better and ME 306. On demand.

ME 480. Mechanical Engineering Seminar. 3 Credits.
Reports and presentations on current developments in mechanical engineering and engineering ethics. Prerequisites: Senior Standing and admission to the professional Mechanical Engineering program. F.

ME 483. Mechanical Measurements Laboratory. 3 Credits.
Experiments and written reports on the operation and performance of instruments and basic mechanical engineering equipment. Prerequisites: EE 206 and admission to the professional Mechanical Engineering program. F.

ME 484. Ground Vehicle Dynamics. 3 Credits.
ME 484 is a junior and senior level elective course. This course deals with the design of ground vehicle suspension and steering systems. Vehicle ride, handling and safety systems are covered along with passive and active suspension control. Prerequisite: ME 322 and admission to the professional Mechanical Engineering program or consent of instructor. On demand.

ME 485. Multiphysics Modeling. 3 Credits.
Theory and techniques of modeling coupled thermal, fluid, mechanical, and/or electrical fields in components design. The focus is on the fundamental techniques used to simultaneously derive and solve coupled equations and the use of commercial multi physics finite element software. Prerequisite: ME 323. S.

ME 487. Engineering Design. 2 Credits.
The first course of a two-course sequence in Engineering Design, students will establish important features of the machine or system to be designed, perform market analysis, establish design objectives, explore alternatives, conduct research, specify constraints. Prerequisites: ME 323, ME 323L, ME 474 or any one elective from the thermal science group, and admission to the professional Mechanical Engineering program. Corequisite: ME 483. Prerequisite or Corequisite: ENGR 460. F.

ME 488. Engineering Design. 3 Credits.
Systematic study and practice essential to the optimal design of a complete machine or system, utilizing economic and social constraints together with current mechanical and thermal design techniques. The course is a continuation of ME 487 taken the preceding semester. Prerequisites: ME 487 and admission to the professional Mechanical Engineering program. S.

ME 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Prerequisites: Consent of the Department, approval of the Honors Committee, and admission to the professional Mechanical Engineering program. Repeatable to 9 credits. F.S.

ME 490. Special Laboratory Problems. 1-3 Credits.
Laboratory investigations of interest to students and faculty. Repeatable to maximum of 6 credits. Prerequisites: Consent of instructor and admission to the professional Mechanical Engineering program. Repeatable to 6 credits. On demand.

Medical Laboratory Science (MLS)
http://med.und.edu/mls

Coleman, Paur (Chair, Program Director), Lunak, Peterson, Peterson, Porter, Ray, Schill, Solberg and Triske
The Department of Medical Laboratory Science at the University of North Dakota has offered a degree in medical laboratory science (formerly clinical laboratory science) since 1949. The Medical Laboratory Science (MLS) program is accredited by the National Accrediting Agency for Medical Laboratory Sciences (NAACLS), which is located at 5600 N. River Road, Suite 720, Rosemont, IL 60018-5119.

Medical Laboratory Scientists, sometimes referred to as medical technologists or clinical laboratory scientists, are key members of the health care team. They are concerned with the study and practice of diagnostic medicine and generate accurate and reliable test results in chemistry, hematology, immunology, immunohematology and microbiology. The results provide valuable information used in the diagnosis and treatment of disease. Excellent employment opportunities exist not only in hospitals and clinics, but also in physician offices, government agencies, industry, research, the armed forces and health related facilities. A workforce shortage of medical laboratory scientists exists and has generated a large demand for new graduates. In addition to immediate employment opportunities, many graduates attend medical school or pursue graduate degrees in medical laboratory science, management or education.

B.S. in Medical Laboratory Science (2+2 Track)

Students complete a pre-professional curriculum (pre-MLS) at UND. The pre-professional curriculum includes approximately four semesters of specific preparatory coursework for admission into the professional (BS MLS) curriculum. The professional program (BS MLS) is approximately five semesters in length and includes three semesters of preparatory coursework and three semesters in the final clinical year. The final clinical year of the professional curriculum is 37 credits and includes a 12-week on-campus experience in the summer semester, online coursework, and a clinical affiliation experience. Upon successful completion of all courses, the student receives a BS in MLS degree from the University of North Dakota and is eligible to complete the national certification exam.

Application for advancement to the professional education component is made directly following the second semester of the sophomore year. Applicants to the professional program must have a cumulative GPA of 2.8 and no more than one D in any math or science course. Exceptions for acceptance and continuance may be made by petition to the Department of Medical Laboratory Science Professional and Academic Standards Committee. During the second year of the professional curriculum (senior year), students register for courses in the summer, fall and spring semesters.

When a student is registered in 300 and 400 level MLS courses a specific MLS tuition is assessed.

Articulation Program

Clinical Laboratory Technician (CLT) or Medical Laboratory Technician (MLT) graduates are encouraged to apply to the UND MLS program to earn a BS in MLS. A CLT/MLT graduate will be eligible for the transfer of up to 60 semester credits depending on the curriculum completed. Transfer credits allow the waiver of several science courses in the professional curriculum. The student’s record is evaluated and a recommendation is made to the Registrar regarding the number of credits to be transferred and the science courses to be waived. The student may be eligible for a shortened professional program based on previous coursework, years of experience working in a clinical laboratory, and a competency assessment. A specific outline for the number of credits that will transfer has been incorporated into articulation agreements with numerous regional technical and community colleges. Contact the MLS program for additional information.

When a student is registered in 300 and 400 level MLS courses, a specific MLS tuition is assessed.

Western College Alliance for Medical Laboratory Science (WCAMLS) Education (3+1 Track)

The Medical Laboratory Science program is affiliated with Bemidji State University, Bemidji, MN; Jamestown College, Jamestown, ND; Mayville State University, Mayville, ND; Minot State University, Minot, ND; Valley City State University, Valley City, ND; Montana State University, Billings, MT; Northern State University, Aberdeen, SD; St. Cloud State University, St. Cloud, MN; University of Mary, Bismarck, ND; University of Minnesota-Crookston, Crookston, MN; University of South Dakota, Vermillion, SD; University of Wisconsin-La Crosse; and Winona State University, Winona, MN. The program of study for the first three years at these colleges is aligned with the UND MLS program. Students from these institutions apply to the UND MLS program for their final year of study. Upon completion of the final year, the student receives a certificate from the University of North Dakota verifying completion of 12 months of clinical training in the UND NAACLS accredited program. The student is then eligible for a degree in Medical Laboratory Science, a related major, or a certificate from their respective institution and eligibility to complete the national certification exam.

B.S. Degree Including 4+1 and WCAMLS Students-General Information

Professional Curriculum Year 2

A summer practicum experience on the UND campus in Grand Forks, ND is required, followed by approximately seven months (fall and spring semesters) in a clinical laboratory of a medical center. There are special requirements prior to contact with patients and testing of patient specimens. A background check, specific immunizations and antibody titers are required by all clinical affiliates prior to working with patients. Students are responsible for additional costs that include: travel, housing, and food.

The program has clinical affiliation agreements with over 70 medical centers in Arizona, Colorado, Iowa, Minnesota, Montana, North Dakota, Oregon, South Dakota, Wisconsin and Wyoming for the clinical experience. A complete list and description of the current clinical sites is available at http://med.und.edu/mls.

Online Courses

There are many courses offered by the MLS program through online or distance learning. The primary method of distance learning course delivery is web-based. Eligibility for distance and online courses can be determined by contacting the MLS office. Students participating in online coursework are required to have Internet access. Specific computer requirements are available from the MLS office.

The Medical Laboratory Science program is within the Department of Medical Laboratory Science.

School of Medicine and Health Sciences

B.S. in Medical Laboratory Science

The Medical Laboratory Science (MLS) courses are listed.

Required: 126 credits (36 of which must be numbered 300 or above, and 60 credits of which must be from a four-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. MLS Curriculum Requirements:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>General Biology I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>General Chemistry I Laboratory</td>
<td>4</td>
</tr>
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<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>&amp; 122L</td>
<td>General Chemistry II Laboratory</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
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<td>Arts &amp; Humanities Elective (Global Diversity Category)</td>
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<tr>
<td>Sophomore Year</td>
<td>First Semester</td>
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<tr>
<td><strong>ANAT 204</strong></td>
<td>Anatomy for Paramedical Personnel</td>
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<tr>
<td><strong>MLS 101</strong></td>
<td>Orientation to Medical Laboratory Sciences</td>
</tr>
<tr>
<td><strong>COMM 212</strong></td>
<td>Interpersonal Communication</td>
</tr>
<tr>
<td><strong>MBIO 202</strong></td>
<td>Introductory Medical Microbiology Lecture</td>
</tr>
<tr>
<td><em>Soc Sci Elective (Introduction to Psychology Recommended)</em></td>
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<tr>
<td><strong>Credits</strong></td>
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<tbody>
<tr>
<td><strong>MLS 234</strong></td>
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<td><strong>MLS 234L</strong></td>
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<tr>
<td><strong>PPT 301</strong></td>
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<tr>
<td><em>Soc Sci Elective (US Diversity Category)</em></td>
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<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td><strong>Professional Curriculum Year 1</strong></td>
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<tr>
<td><strong>MLS 301</strong></td>
</tr>
<tr>
<td><strong>MLS 325</strong></td>
</tr>
<tr>
<td><strong>MLS 325L</strong></td>
</tr>
<tr>
<td><strong>MLS 336</strong></td>
</tr>
<tr>
<td><em>Soc Sci Elect (Introduction to Sociology Recommended)</em></td>
</tr>
<tr>
<td><em>Arts &amp; Humanities Elective (Fine Arts Category)</em></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td><strong>MLS 340</strong></td>
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<tr>
<td><strong>MLS 340L</strong></td>
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<tr>
<td><strong>MLS 380</strong></td>
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<tr>
<td><strong>MLS 394</strong></td>
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<tr>
<td><strong>BMB 301</strong></td>
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<tr>
<td><strong>MGMT 300</strong></td>
</tr>
<tr>
<td><em>Arts &amp; Humanities (Humanities Category)</em></td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
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</thead>
<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td><strong>Professional Curriculum Year 2</strong></td>
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<td><strong>Credits</strong></td>
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<tr>
<th>Summer</th>
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<tr>
<td><strong>MLS 471</strong></td>
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<td><strong>MLS 472</strong></td>
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<td><strong>MLS 473</strong></td>
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<td><strong>MLS 474</strong></td>
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<td><strong>MLS 477</strong></td>
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<tr>
<td><strong>MLS 477L</strong></td>
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<tr>
<td><strong>MLS 478</strong></td>
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<tr>
<td><strong>MLS 479</strong></td>
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<th>Fall</th>
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<tbody>
<tr>
<td><strong>MLS 480</strong></td>
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<td><strong>MLS 481</strong></td>
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<td><strong>MLS 483</strong></td>
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<tr>
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<td><strong>MLS 485</strong></td>
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<td><strong>MLS 487</strong></td>
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<td><strong>MLS 488</strong></td>
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<tr>
<td><strong>MLS 489</strong></td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<th>Spring</th>
</tr>
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<tbody>
<tr>
<td><strong>MLS 490</strong></td>
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</tbody>
</table>

**Certificate in Medical Laboratory Science Program (4+1 Track)**

Students enrolled in the certificate program (4+1 track) have earned a baccalaureate degree from a regionally accredited college or university. Prior to entering the final clinical year of the professional program, the student must complete specific prerequisite courses. The final clinical year is the same as the traditional (2+2 track) and the Western College Alliance (3+1 track) student experience. The 4+1 student earns a certificate in Medical Laboratory Science from the University of North Dakota upon successful completion of all courses and is eligible to complete the national certification exam. If a student wishes to earn a second baccalaureate degree in Medical Laboratory Science from the University of North Dakota, the student must also have completed coursework to meet the Essential Studies requirements.

**Prerequisite Courses Credits**

| General Chemistry | 8 |
| Organic Chemistry | 3 |
| Biochemistry | 3 |
| General Biology | 6 |
| Microbiology | 3 |
| Anatomy | 3 |
| Physiology | 3 |
| **MLS 234** Human Parasitology | 2 |
| **MLS 301** Immunology | 3 |
| **MLS 325** Hematology | 3 |
| **MLS 325L** Hematology Laboratory | 2 |
| **MLS 336** Laboratory Calculations (Recommended) | 1 |
| **MLS 340** Molecular Diagnostics | 2 |
| **MLS 394** Medical Microbiology (Recommended) | 2 |
| **Total Credits** | 44 |

* Available online from the MLS Program
** Offered as an intensive laboratory on campus in May

When a student is registered in 300 and 400 level MLS courses a specific MLS tuition is assessed.

Upon successful completion of the prerequisite coursework, the 4+1 student applies to the second year of the professional program (see BS MLS Professional Curriculum Year 2 previously listed). The applicant must have a cumulative GPA of 2.8, and no more than one D in any math or science course. Exceptions for acceptance and continuance may be made by petitioning the Department of Medical Laboratory Science Professional and Academic Standards Committee.

Upon successful completion of the 4+1 program of study, the student will earn a certificate in MLS from UND and will be eligible to complete the national certification exam. If a student wishes to earn a second baccalaureate degree in Medical Laboratory Science from the University of North Dakota, the student must also have completed coursework to meet the Essential Studies requirements.

**Categorical Certificate Training Program**

The Medical Laboratory Science Categorical Certificate Training Program from the University of North Dakota provides advanced skills to baccalaureate prepared students, enabling them to work in high complexity clinical laboratories. The program includes four individual certificate categories: Clinical...
Admission Requirements

To be admitted to the UND MLS Categorical Program(s), the student must meet the following requirements:

- Hold a baccalaureate degree from a regionally accredited college or university
- Have a minimum of 20 semester credit hours in the biological, chemical and/or medical sciences (these credits can be part of, or in addition to the B.S. degree)
- Have the support of an accredited medical laboratory to facilitate the student’s clinical experience

Clinical Chemistry/Urinalysis

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MLS 336</td>
<td>Laboratory Calculations</td>
<td>1</td>
</tr>
<tr>
<td>MLS 340</td>
<td>Molecular Diagnostics</td>
<td>2</td>
</tr>
<tr>
<td>MLS 460</td>
<td>Laboratory Practice</td>
<td>2</td>
</tr>
<tr>
<td>MLS 465</td>
<td>Clinical Laboratory Management</td>
<td>3</td>
</tr>
<tr>
<td>MLS 471</td>
<td>Clinical Chemistry I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 474</td>
<td>Clinical Urinalysis I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 481</td>
<td>Clinical Chemistry II</td>
<td>2</td>
</tr>
<tr>
<td>MLS 485</td>
<td>Clinical Urinalysis II</td>
<td>1</td>
</tr>
<tr>
<td>MLS 489</td>
<td>Clinical Body Fluids</td>
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</tr>
<tr>
<td>MLS 491</td>
<td>Clinical Chemistry III</td>
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</table>

Total Credits: 18

Hematology/Hemostasis

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MLS 325</td>
<td>Hematology</td>
<td>3</td>
</tr>
<tr>
<td>MLS 325L</td>
<td>Hematology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>MLS 336</td>
<td>Laboratory Calculations</td>
<td>1</td>
</tr>
<tr>
<td>MLS 460</td>
<td>Laboratory Practice</td>
<td>2</td>
</tr>
<tr>
<td>MLS 465</td>
<td>Clinical Laboratory Management</td>
<td>3</td>
</tr>
<tr>
<td>MLS 473</td>
<td>Clinical Hemostasis I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 479</td>
<td>Clinical Hematology I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 483</td>
<td>Clinical Hemostasis II</td>
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</tr>
<tr>
<td>MLS 488</td>
<td>Clinical Hemostasis II</td>
<td>2</td>
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<tr>
<td>MLS 489</td>
<td>Clinical Body Fluids</td>
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<tr>
<td>MLS 498</td>
<td>Clinical Hematology III</td>
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Total Credits: 18

Immunohematology

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MLS 301</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MLS 336</td>
<td>Laboratory Calculations</td>
<td>1</td>
</tr>
<tr>
<td>MLS 460</td>
<td>Laboratory Practice</td>
<td>2</td>
</tr>
<tr>
<td>MLS 465</td>
<td>Clinical Laboratory Management</td>
<td>3</td>
</tr>
<tr>
<td>MLS 473</td>
<td>Clinical Hemostasis I</td>
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<tr>
<td>MLS 477</td>
<td>Clinical Immunohematology I</td>
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</tr>
<tr>
<td>MLS 477L</td>
<td>Clinical Immunohematology I Lab</td>
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</tr>
<tr>
<td>MLS 480</td>
<td>Clinical Immunohematology II</td>
<td>2</td>
</tr>
<tr>
<td>MLS 492</td>
<td>Clinical Immunohematology III</td>
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<tr>
<td>MLS 494</td>
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Total Credits: 18

Microbiology

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MLS 234</td>
<td>Human Parasitology</td>
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</tr>
<tr>
<td>MLS 336</td>
<td>Laboratory Calculations</td>
<td>1</td>
</tr>
<tr>
<td>MLS 340</td>
<td>Molecular Diagnostics</td>
<td>2</td>
</tr>
<tr>
<td>MLS 394</td>
<td>Medical Microbiology</td>
<td>2</td>
</tr>
<tr>
<td>MLS 460</td>
<td>Laboratory Practice</td>
<td>2</td>
</tr>
<tr>
<td>MLS 465</td>
<td>Clinical Laboratory Management</td>
<td>3</td>
</tr>
<tr>
<td>MLS 478</td>
<td>Clinical Microbiology I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 484</td>
<td>Clinical Microbiology II</td>
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<tr>
<td>MLS 487</td>
<td>Medical Mycology</td>
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<tr>
<td>MLS 495</td>
<td>Clinical Microbiology III</td>
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Total Credits: 19

When a student is registered in 300 and 400 level MLS courses, a specific MLS tuition is assessed.

Courses

**MLS 301. Immunology. 3 Credits.**
Principles of clinical immunology focusing on the cellular and molecular nature of antigens and immunoglobulin, the immune response, immunogenetics, and immune-mediated disease. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. F,S,SS.

**MLS 325. Hematology. 3 Credits.**
Identification of normal and abnormal blood cells in various hematological disorders. Theory and application of hematology procedures. Theory and mechanisms of hemostasis. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. F.

**MLS 326. Laboratory Calculations. 1 Credit.**
Calculations used in the clinical laboratory including measurement systems, dilutions, graphing, solution chemistry, statistics of quality control and research interpretation. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. F,S,SS.

**MLS 336. Molecular Diagnostics. 2 Credits.**
An introduction to specific molecular biology application in the laboratory and a discussion of cell biology, DNA chemistry, genetics, nucleic acid extraction and modification, blotting, polymerase chain reactions, and probes in relation to diagnostic investigations. Prerequisites: MLS program students only. S.

**MLS 340. Medical Microbiology. 2 Credits.**
Application of molecular techniques including the operation of molecular based instrumentation, DNA extraction and measurement, blotting, polymerase chain reactions, and utilization of probes. Prerequisites: MLS program students only. S.

**MLS 340L. Molecular Diagnostics Laboratory. 1 Credit.**
Discussion of CLS professional issues, ethics, current topics of healthcare delivery, governmental regulations, societal concerns, cultural diversity, disease prevention, research and environment. Prerequisites: MLS Program Students Only. SS.
MLS 394. Medical Microbiology. 2 Credits.
Medically important microorganisms are identified using a wide variety of
technical techniques. Included in the discussion will be susceptibility studies
and the correlation of the presence of microorganisms to health and disease.
Prerequisites: MLS, Categorical Certificate Clinical Chemistry/Urinalysis,
Categorical Certificate Hematology/Hemostasis, Categorical Certificate
Immunohematology or Categorical Certificate Microbiology program students only. S.

MLS 399. Special Topics in Clinical Laboratory Science. 1-13 Credits.
Lecture, discussion, and readings on topics of current interest in the clinical
laboratory sciences. Prerequisites: MLS Program Students Only. Repeatable to
13 credits. F,S,SS.

MLS 430. Clinical Practicum I. 12 Credits.
Applied theory and practice at the clinical affiliate. S/U grading. F.

MLS 440. Clinical Practicum II. 12 Credits.
Applied theory and practice at the clinical affiliate. S/U grading. S.

MLS 460. Laboratory Practice. 2 Credits.
This course represents an overview of standard laboratory practices including
safety, glassware, microscopes, centrifuges, balances, specimen collection
and handling. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/
Hemostasis, Immunohematology or Microbiology program students only.
F,S,SS.

MLS 464. Clinical Review. 3 Credits.
Emphasis is on concepts related to the role of a clinical laboratory scientist.
Analysis and evaluation focuses on the theories of immunohematology, clinical
chemistry, microbiology, hematology and other areas contributing to clinical
application. F.

MLS 465. Clinical Laboratory Management. 3 Credits.
Management practices in the clinical laboratory including concepts related to
service and quality, information management, financial management, personnel
management, laboratory education and research. Prerequisites: MLS, Clinical
Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or
Microbiology program students only. F,S,SS.

MLS 471. Clinical Chemistry I. 2 Credits.
Theories and principles of clinical chemistry procedures are discussed as
well as how the results of these procedures correlate to health and disease.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. SS.

MLS 472. Pre-analytical Skills. 1 Credit.
Theory and practice of phlebotomy in the clinical setting, specimen processing,
review of state and federal regulations, safety and biohazard compliance,
interpersonal relationship skills. Prerequisites: MLS Program Students Only.
S,SS.

MLS 473. Clinical Hemostasis I. 2 Credits.
Physiologic mechanisms of normal human hemostasis as well as hereditary
and acquired defects. Laboratory techniques performed and discussed are
screening tests and specific assays for abnormalities, procedures to monitor
therapeutic measures and practice and maintenance of current instrumentation.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. SS.

MLS 474. Clinical Urinalysis I. 2 Credits.
Theory, techniques and practice of microscopy and urinalysis with emphasis
on identification of elements in the sediment. Prerequisites: MLS, Clinical
Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or
Microbiology program students only. SS.

MLS 477. Clinical Immunohematology I. 1 Credit.
Theory of modern transfusion techniques, component therapy, and quality
assurance. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/
Hemostasis, Immunohematology or Microbiology program students only. SS.

MLS 477L. Clinical Immunohematology I Lab. 1 Credit.
Practical application of modern transfusion techniques, component therapy,
and quality assurance. Prerequisites: MLS, Clinical Chemistry/Urinalysis,
Hematology/Hemostasis, Immunohematology or Microbiology program
students only. SS.

MLS 478. Clinical Microbiology I. 2 Credits.
Groups of medically important bacteria are studied and correlated to laboratory
practice in identification. Included in the discussions are antibiotic susceptibility
testing, quality control, and methods of identification including rapid, automated,
and traditional methods. Prerequisites: MLS, Clinical Chemistry/Urinalysis,
Hematology/Hemostasis, Immunohematology or Microbiology program students only. SS.

MLS 479. Clinical Hematology I. 2 Credits.
Emphasis on interpretive correlation of hematology findings and
pathophysiology. Topics of current interest and advances in hematology.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. SS.

MLS 480. Clinical Immunohematology II. 2 Credits.
Applied theory and modern transfusion at the clinical affiliate. Offered annually.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only.

MLS 481. Clinical Chemistry II. 2 Credits.
Applied theory and practice in clinical chemistry at the clinical affiliate.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. F.

MLS 483. Clinical Hemostasis II. 1 Credit.
Techniques and practice in routine phlebotomy and hemostasis at the clinical
affiliate. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/
Hemostasis, Immunohematology or Microbiology program students only. F.

MLS 484. Clinical Microbiology II. 2 Credits.
Applied theory and practice in clinical microbiology at the clinical affiliate.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. F.

MLS 485. Clinical Urinalysis II. 1 Credit.
Applied theory and practice in urinalysis and observation, practice, or research
in specialized areas or settings at the clinical affiliate. Prerequisites: MLS,
Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or
Microbiology program students only. F.

MLS 487. Medical Mycology. 1 Credit.
Comparative morphology, physiology and pathogenicity of medically important
fungi. Laboratory methods for identification emphasize interpretation and
evaluation of results including the recognition of contaminating organisms.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. F.

MLS 488. Clinical Hematology II. 2 Credits.
Applied theory and practice in clinical hematology at the clinical affiliate.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. F.

MLS 489. Clinical Body Fluids. 1 Credit.
Overview of the theory and practice in manual procedures of human body
fluids. The body fluids to be discussed include: spinal, synovial and amniotic
fluid, transudates and exudates, fecal specimens, gastric, sweat, and other
body fluid secretions. Prerequisites: MLS, Clinical Chemistry/Urinalysis,
Hematology/Hemostasis, Immunohematology or Microbiology program
students only. F.

MLS 490. Financial and Quality Management of the Clinical Laboratory. 3
Credits.
A capstone course designed to provide senior students with the skills to
manage a clinical laboratory. The course brings together previous content
with a focus on laboratory profitability, quality management, and quality
improvement. Offered annually. Prerequisites: Enrollment in clinical practicum
coursework is the corequisite; MLS program students only. S.

MLS 491. Clinical Chemistry III. 2 Credits.
Techniques and practice in clinical chemistry at the clinical affiliate.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. S.

MLS 492. Clinical Immunohematology III. 2 Credits.
Techniques and modern transfusion practices at the clinical affiliate.
Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis,
Immunohematology or Microbiology program students only. S.
**Military Science (MS)**

https://www.und.edu/ROTC

Murphy (Chair), Clark, Scholberg, Ayers, and Gass

The Army Reserve Officer Training Corps (ROTC) offers a program of instruction designed to mold men and women into responsible, self-disciplined citizens and leaders. Students seeking a commission as a second lieutenant in the United States Army can expect to learn and develop the following skills: time management, oral and written communication, leadership, management, problem solving and decision making. Selection for active duty and for commissioning as an Army officer is competitive. Students commissioned as reserve officers may request active duty or may serve with the Army Reserve or National Guard after a short period of active duty for officer training. The program is voluntary and is open to both male and female students. Enrollment in Military Science I (freshman year) entails no military service obligation. This offers the student an opportunity to explore military science subjects and is a basis upon which to decide about further enrollment in military science including entering competition for an ROTC scholarship. Winners of three or four year ROTC scholarships incur a military obligation when they enter their MS II (sophomore) year. Other students incur no obligation until their MS III (junior) year. Successful completion of MS I and MS II is a prerequisite to enrollment in MS III and MS IV; however, placement credit procedures are available for veterans, Junior ROTC participants, and transfer students formerly enrolled in other ROTC programs, or by completion of a summer Cadet Initial Entry Training (CIET). Direct questions concerning placement eligibility to the Department of Military Science. Financial assistance is available in the form of two, three, and four year ROTC scholarships. This scholarship pays tuition and laboratory fees or room and board, a flat rate for textbooks and a monthly stipend. All ROTC scholarship students and each non-scholarship junior and senior are paid a graduated stipend. The advance course may be taken for credit only by non-obligated students with prior arrangement through the Department of Military Science. The Department of Military Science is housed in the University Armory which contains a library, physical fitness center, and a computer lab for the use of enrolled students.

**Professional Military Education Requirements**

In addition to successfully completing the ROTC curriculum and earning a baccalaureate degree, a cadet must complete an undergraduate history course to meet the requirements for commissioning. Specifically, cadets must take a course in American military history, e.g., Military History, WWII, Nuclear Weapons and the Modern Age, U.S. and Vietnam 1945-1975, U.S. Foreign Relations Since 1900.

**Minor in Military Science**

Required 29 credits, including:

- MS 301 Military Science III 3
- MS 301L Leadership Lab III 1
- MS 302 Military Science III 3
- MS 302L Leadership Lab III 1
- MS 341 Military Physical Conditioning III 1
- MS 342 Military Physical Conditioning III 1
- MS 401 Military Science IV 3
- MS 401L Leadership Lab IV 1
- MS 402 Military Science IV 3
- MS 402L Leadership Lab IV 1
- MS 441 Military Physical Conditioning IV 1
- MS 442 Military Physical Conditioning IV 1
- HIST 210 United States Military History 3
- or MS 499 Special Topics

Select one of the following: 3

- POLS 220 International Politics
- POLS 225 Comparative Politics
- HIST 269 World War II
- HIST 335 Nuclear Weapons and the Modern Age
MS 101. Military Science I. 2 Credits.
This beginner class introduces you to the personal challenges and competencies that are critical for effective leadership and communication. You will learn how the personal development of life skills such as cultural understanding, goal setting, time management, stress management, and comprehensive fitness relate to leadership, officer, and the Army profession. Participation in a weekend exercise is optional. F.

MS 101L. Leadership Lab I. 1 Credit.
An introduction to individual and team aspects of military team building and leadership in small unit operations. Includes basic drill and ceremony, marksmanship training and fundamental concepts of leadership. Corequisite: MS 101. F.

MS 102. Military Science I. 2 Credits.
Introduces you to the professional challenges and competencies that are needed for effective execution of the profession of arms and Army communication. Through this course, you will learn how Army ethics and values shape your army and the specific ways that these ethics are inculcated into Army culture. Prerequisite: MS 101. S.

MS 102L. Leadership Lab I. 1 Credit.
An introduction to individual and team aspects of military team building and leadership in small unit operations. Includes operation order writing, team level movement techniques and continue concepts of leadership. Corequisite: MS 102. S.

MS 201. Military Science II. 2 Credits.
This class primarily is drawn from the Adaptability Army Learning Area (ALA). The outcomes are demonstrated through Critical and Creative Thinking and the ability to apply Troop Leading Procedures (TLP). Comprehension of the officer's role in Leading Change by applying Innovative Solutions to Problems in concert with the Principles of Mission Command. The Army Profession is also stressed through leadership forum and a leadership self-assessment. Prerequisites: MS 101 and MS 102. F.

MS 201L. Leadership Lab II. 1 Credit.
Learn and apply the principles of effective leadership. Reinforce self confidence. Includes drill and ceremony, weapon qualification and leadership principles. Corequisites: MS 201 and MS 241. F.

MS 202. Military Science II. 2 Credits.
This class begins the journey to understand and demonstrate Cross-Cultural Competencies as they relate to Army doctrine and how they apply in a combatant commander's Engagement Strategies. Army Values, Teamwork, and Warrior Ethos and their relationship to the Law of Land Warfare and philosophy of military service are also stressed. The ability to lead and follow is also covered through Team Building exercises in small units up to squad level. Prerequisites: MS 101, MS 102, and MS 201. S.

MS 202L. Leadership Lab II. 1 Credit.
Learn and apply the principles of effective leadership. Reinforce self confidence. Includes small unit tactics, land navigation and FLRC (Field Leadership Reaction Course). Corequisites: MS 202 and MS 242. S.

MS 215. Conflict Simulation. 1 Credit.
A course analyzing military strategy and tactics through the use of war gaming activities based upon historical renderings. F.S.

MS 241. Military Physical Conditioning II. 1 Credit.
Building on concepts of the 100 level class, emphasizing on the Army components of physical fitness; cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student to achieve a minimum score of 230 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. Corequisites: MS 201 and MS 201L. F.

MS 242. Military Physical Conditioning II. 1 Credit.
Continuation of 201 with emphasis on leadership of a squad during physical training, supervising each individual's correct performance of stretching and calisthenics, as well as following assigned students progression and taking responsibility for mentoring subordinates. A key objective is for each student to achieve a minimum score of 230 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, situps, and a timed two-mile run. Corequisites: MS 202 and MS 202L. S.

MS 290. ROTC Basic Course. 4 Credits.
This course allows those students to receive credit for completing Basic Training and AIT; A DD214 is required or completion of CIET (Cadet Initial Entry Training). Both options also be used to enter the advanced course Army ROTC. It also can be used by military veterans to receive credit for completion of basic training and advanced occupational skill training; A DD214 is required. F, S, SS.

MS 301. Military Science III. 3 Credits.
Series of practical opportunities in leadership and problem solving used to lead small groups, receive personal assessments and encouragement, and lead again in situations of increasing complexity. Uses small unit tactics and opportunities to plan and conduct training for lower division students both to develop such skills and as vehicles for practicing leadership skills. Plan and execute a leadership lab class for the ROTC Battalion. Participation in one weekend exercise is also required, and one or two more weekend exercises may be offered for optional participation. Prerequisites: MS 101, MS 102, MS 201, MS 202 or Basic Combat Training or (CIET) Cadet Initial Entry Training. Corequisites: MS 301L and MS 341. F.

MS 301L. Leadership Lab III. 1 Credit.
Series of practical opportunities to lead small groups, receive personal assessments. Use small unit tactics and opportunities to plan and conduct training for lower division students. Prerequisite: MS 101, MS 102, MS 201, and MS 202. Corequisites: MS 301 and MS 341. F.

MS 302. Military Science III. 3 Credits.
Continues methodology of MS3 301. Analyze tasks; prepare written or oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Plan for and adapt to the unexpected in organizations under stress. Examine and apply lessons from leadership case studies. Examine importance of ethical decision making in setting a positive climate that enhances team performance. Plan and execute a leadership lab class for the ROTC Battalion. Participation in one weekend exercise is required; two other weekend exercises option. Prerequisites: MS 101, MS 102, MS 201, MS 202, and MS 301. Corequisites: MS 302L and MS 342. S.

MS 302L. Leadership Lab III. 1 Credit.
Series of practical opportunities to lead small groups, receive personal assessments. Use small unit tactics and opportunities to plan and conduct training for lower division students. Corequisites: MS 302 and MS 342. S.

MS 341. Military Physical Conditioning III. 1 Credit.
Instruction is on leadership of a company sized element and the phases of fitness conditioning, preparatory conditioning, and maintenance. A key objective is for each student to achieve a minimum score of 260 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. Corequisites: MS 301 and 301L. F.

MS 342. Military Physical Conditioning III. 1 Credit.
Continuation of 341 with instruction on leadership of a company sized element and the phases of fitness conditioning, preparatory conditioning, and maintenance. A key objective is for each student to achieve a minimum score of 260 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. Corequisites: MS 302 and MS 302L. S.
MS 402. Military Science IV. 3 Credits.

This course is the culmination of a well-rounded four year educational experience. It is during this semester that the Cadet is undergoing final preparation for commissioning and integration into the Army. The emphasis is placed on skills that the newly commissioned officer will need to succeed in their first unit of assignment, demonstrating the ability to plan, prepare, execute, and assess platoon-level training strategies to enable mission accomplishment. Course includes leadership laboratories and field exercises. Prerequisites: MS 101, MS 102, MS 201, MS 202, MS 301, MS 302, and MS 401. Corequisites: MS 402L and MS 442. S.

MS 442. Military Physical Conditioning IV. 1 Credit.

Continuation of 441 with emphasis on grasping the Army's policy on physical fitness, fitness maintenance, and safety. Become familiar with Army regulations and evaluation of fitness ends. An essential objective for each student is to achieve a minimum score of 270 points total, in the three events of the Army Physical Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. Corequisites: MS 401 and MS 401L. F.

MS 444. Military Physical Conditioning IV. 1 Credit.

A culmination of all the concepts learned in the previous classes with emphasis on writing operation orders for company level and higher. Responsible for all Army ROTC Cadet Battalion training involving a series of practical exercises and evaluation of training. Corequisites: MS 402 and MS 442. S.

MS 441. Military Physical Conditioning IV. 1 Credit.

Putting together all of the personal fitness concepts learned in the previous classes with emphasis on leadership of a battalion sized organization, including planning and coordination of all physical fitness for the ROTC Battalion and evaluation of the personal fitness training and trainers. Coordination of individual training specific to fitness ends. An essential objective for each student is to achieve a minimum score of 270 points total, in the three events of the Army Physical Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. Corequisites: MS 401 and MS 401L. F.

The Bachelor of Music degree program offers majors in Performance, Music Education, or Music Therapy must complete an audition for admission. The audition includes a performance of a solo piece, sight-reading, and a music history essay. Students interested in auditioning for the music department should contact the Department of Music for more information.
year, and to present a full recital during the fourth year. This degree is only available on select instruments. Contact the department for details.

The Music Education major is designed for the student who wishes to become a music teacher in the elementary and secondary schools and is intended to develop the requisite knowledge, performance, teaching abilities, and official certification needed to function as a professional music educator. The student will select either an instrumental or vocal/choral emphasis, with the option of completing both (additional credits are required for dual certification), culminating in the presentation of a half recital. The successful completion of this program will qualify the student for state licensure in general music, grades K-12, and instrumental or choral music (or both if dual certification is completed).

Music Education majors must complete seven semesters, not semester hours, of applied lessons. They are similarly required to complete a minimum of seven semesters in a major performing ensemble in their major performing area, i.e., Concert Choir, Women’s Choir, Varsity Bands, Wind Ensemble, University Band, or University Chamber Orchestra.

The Music Therapy major, approved by the American Music Therapy Association (AMTA), is a competency-based program which includes both academic and clinical work and culminates in an AMTA-approved internship. Prior to the completion of first-year music courses, music therapy majors must meet with music therapy faculty to determine suitability for continuation in the program (see the Department of Music Student Handbook for further details). Additionally, music therapy majors must pass yearly statewide (MN and ND) and nationwide criminal history background checks in order to enroll in practicum courses. Academic requirements include courses in music, music therapy and related fields. Clinical requirements include a minimum of four levels of practica in a variety of community settings under the supervision of a music therapist. Graduates of the program will be able to sit for the national certification examination administered by the Certification Board for Music Therapists. After successful completion of this examination, the graduate will be a Music Therapist-Board Certified (MT-BC).

The Bachelor of Arts degree program in music is designed for the student who wishes a general liberal arts education with emphasis in music. Along with a broad coverage of the discipline, the student selects an area of concentration, e.g., music history, music theory, music technology, composition, culminating in a final project.

All undergraduate music majors undergo the Sophomore Review process, which examines both performance and academic skills. The Sophomore Review Performance Jury occurs at the end of the fourth semester of applied lessons, assuming students have completed two semesters at the 1xx level, and are at the end of their second semester at the 2xx level. Students are required to pass this jury in order to continue in the normal progression of lessons to the 3xx level. The Sophomore Review Academic Evaluation consists of a review of core coursework taken during the first two years of music study. All music majors must receive a grade of “C” or better in all music courses in order to graduate. In sequential courses, students must receive a grade of “C” or better in order to progress to the next course in the sequence. Students deficient in core courses at the time of the Sophomore Review will be notified, and must remedy those deficiencies in order to graduate in a timely manner. Some music degree programs require that the Sophomore Review be passed prior to enrollment in that degree’s essential studies capstone course.

A Department of Music Student Handbook is available to students as a supplement to this catalog. That volume includes the most recent updates of policies and procedures and may supersede information presented here.

Bachelor of Music with a Major in Music Therapy (p. 195) Bachelor of Music with a Major in Music Therapy (p. ) Bachelor of Arts with a Major in Music (p. ) Bachelor of Arts with a Major in Music (p. ) Bachelor of Music with a Major in Music Education (p. 195)

College of Arts and Sciences
Bachelor of Music with a Major in Performance

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ER listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 311</td>
<td>Music History Survey II</td>
<td></td>
</tr>
<tr>
<td>MUSC 490</td>
<td>Seminar in Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 256</td>
<td>Basic Conducting</td>
<td>2</td>
</tr>
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Harmony and Theory Sequence

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<tr>
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<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 230</td>
<td>Music Theory III</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
<td>3</td>
</tr>
</tbody>
</table>

Aural Skills Sequence

<table>
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<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
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Performance Courses

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<tr>
<th>Category</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Major Instrument</td>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td>4</td>
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<tr>
<td></td>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td></td>
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<tr>
<td></td>
<td>MUSC 444</td>
<td>Applied Music Pedagogy</td>
<td>2</td>
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<td></td>
<td>MUSC 359</td>
<td>Junior Recital</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 459</td>
<td>Senior Recital</td>
<td>1-2</td>
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</table>

Piano Proficiency through Level IV or Keyboard Skills Sequence

<table>
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<tr>
<th>Course</th>
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<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td></td>
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<tr>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td></td>
</tr>
<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
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</tbody>
</table>

Major Electives

Select one major from the options below. 33-36

Total Credits 99-103

Vocal Majors

Performance Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 242</td>
<td>Diction for Singers</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 269</td>
<td>Opera Workshop</td>
<td>2</td>
</tr>
</tbody>
</table>

Ensembles, Large and Small

History, Literature, Theory and Composition

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MUSC 415</td>
<td>Vocal Literature</td>
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</tbody>
</table>

Electives 6

Foreign Language Requirement

Select one of the following: 8

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>FREN 101</td>
<td>First Year French I</td>
<td></td>
</tr>
<tr>
<td>&amp; FREN 102</td>
<td>First Year French II</td>
<td></td>
</tr>
<tr>
<td>GERM 101</td>
<td>First Year German I</td>
<td></td>
</tr>
<tr>
<td>&amp; GERM 102</td>
<td>First Year German II</td>
<td></td>
</tr>
</tbody>
</table>

Other Electives

Electives in disciplines other than the major 6

Total Credits 36

Instrumental Majors

Performance Courses on Primary Instrument

Large Ensembles or

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 278</td>
<td>Seminar for Collaborative Piano</td>
<td>8</td>
</tr>
<tr>
<td>MUSC 277</td>
<td>Chamber Music Groups</td>
<td>4</td>
</tr>
</tbody>
</table>
## Bachelor of Music with a Major in Music Education

### (Instrumental or Choral Emphasis)

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

#### I. Essential Studies Requirements (see University ES listing).

#### II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I &amp; MUSC 311 &amp; Music History Survey II</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 256</td>
<td>Basic Conducting</td>
<td>2</td>
</tr>
</tbody>
</table>

### Harmony and Theory Sequence

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 230</td>
<td>Music Theory III</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
<td>3</td>
</tr>
</tbody>
</table>

### Aural Skills Sequence

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
<td>1</td>
</tr>
</tbody>
</table>

### Piano Proficiency through Level IV or Keyboard Skills Sequence:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td></td>
</tr>
<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td></td>
</tr>
<tr>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td></td>
</tr>
<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td></td>
</tr>
</tbody>
</table>

### Professional Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 386</td>
<td>Field Experience</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1-4</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>4-16</td>
</tr>
<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

(See advisor for clarification.)

### Emphasis

Select one emphasis from the options below (and optional track).

### Instrumental Emphasis

This coursework meets the criteria for the Instrumental Licensure in Music Education in North Dakota.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 468</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

* Credits apply toward T&L 390 Special Topics

### Performace

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 459</td>
<td>Senior Recital</td>
<td>1</td>
</tr>
</tbody>
</table>

### Vocal/Choral Emphasis

This coursework meets the criteria for the Choral Licensure in Music Education in North Dakota.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 445</td>
<td>Choral Methods For Directors</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 416</td>
<td>Choral Literature</td>
<td>2</td>
</tr>
</tbody>
</table>

Select one of the following:

- MUSC 260 Concert Choir
- MUSC 263 Varsity Bards Men's Chorus
- MUSC 264 Women's Chorus
- MUSC 357 Choral Conducting
- MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice

### Music Technology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 340</td>
<td>Introduction to Music Technology</td>
<td>2</td>
</tr>
</tbody>
</table>

### Vocal/Choral Emphasis

This coursework meets the criteria for the Choral Licensure in Music Education in North Dakota.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 427</td>
<td>Analysis of Musical Form</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 416</td>
<td>Choral Literature</td>
<td>2</td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td></td>
</tr>
<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td></td>
</tr>
<tr>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td></td>
</tr>
<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td></td>
</tr>
</tbody>
</table>

## Instrumental Emphasis

This coursework meets the criteria for the Instrumental Licensure in Music Education in North Dakota.

### Other Studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 427</td>
<td>Analysis of Musical Form</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 417</td>
<td>Instrumental Literature</td>
<td>2</td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>MUSC 459</td>
<td>Senior Recital</td>
<td>1</td>
</tr>
</tbody>
</table>
Music Education

MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice 2
MUSC 150 Class Lessons 1
MUSC 180 Introduction to Music Therapy 3
MUSC 242 Diction for Singers 1
MUSC 440 Methods and Materials for Elementary Music 3
MUSC 441 Methods and Materials for Middle and Secondary School Music 3
MUSC 444 Applied Music Pedagogy 2
MUSC 445 Choral Methods For Directors 3

Music Technology

MUSC 340 Introduction to Music Technology 2

Total Credits 49

* Credits apply toward T&L 390 Special Topics

Optional Instrumental Licensure Track

This additional coursework meets the criteria for Instrumental Licensure in Music Education in North Dakota.

Instrumental Option

MUSC 446 Instrumental Classroom Methods and Materials 3
MUSC 417 Instrumental Literature 2
Large Instrumental Ensemble 1
MUSC 270 Wind Ensemble
MUSC 271 University Band
MUSC 274 Symphony Orchestra
MUSC 275 University Chamber Orchestra
MUSC 357 Choral Conducting 2
MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice 1

Total Credits 9

* Included in Vocal/Choral Emphasis

Bachelor of Music with a Major in Music Therapy

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Review. Prior to entrance into Music Therapy Practicum courses (MUSC 282, MUSC 382, MUSC 383, MUSC 481), students are required to obtain statewide (MN and ND) and nationwide criminal history background checks with acceptable results. Background checks must be updated yearly. Contact your advisor for details.

Core Courses

MUSC 203 Music and Culture 3
MUSC 310 Music History Survey I 6
& MUSC 311 and Music History Survey II 3
MUSC 490 Seminar in Music 3

Harmony and Theory Sequence

MUSC 130 Music Theory I 3
MUSC 134 Music Theory II 3
MUSC 230 Music Theory III 3
MUSC 234 Music Theory IV: Music Theory since 1900 3

Aural Skills Sequence

MUSC 131 Aural Skills I 1
MUSC 135 Aural Skills II 1
MUSC 231 Aural Skills III 1
MUSC 235 Aural Skills IV 1

Supporting Courses in Music

Applied lessons (one instrument or voice) 8
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, & MUSC 399 Voice 4
&MUSC 140 and Special Topics

Piano Proficiency through Level IV or Keyboard Skills Sequence 4
MUSC 133 Keyboard Skills I
MUSC 136 Keyboard Skills II
MUSC 233 Keyboard Skills III
MUSC 236 Keyboard Skills IV

Major Ensembles (at least three different) 6
MUSC 256 Basic Conducting 2
MUSC 423 Instrumental and Choral Arranging 2
MUSC 340 Introduction to Music Technology 2

Music Therapy Courses

MUSC 180 Introduction to Music Therapy 3
MUSC 280 Music Therapy Clinical Skills 3
MUSC 281 Music Therapy Techniques I 2
MUSC 282 Music Therapy Practicum I 1
MUSC 380 Music Therapy Theories and Methods II (Adults) 3
MUSC 381 Music Therapy Techniques II 2
MUSC 382 Music Therapy Practicum II 1
MUSC 383 Music Therapy Practicum III 1
MUSC 480 Psychological Foundations of Music Learning 3
MUSC 481 Music Therapy Practicum IV 1
MUSC 497 Music Therapy Internship (with placement approved by adviser) 3
or MUSC 397 Cooperative Education in Music

Additional Required Courses

PSYC 111 Introduction to Psychology 3
PSYC 250 Developmental Psychology 4
PSYC 270 Abnormal Psychology 3
ANAT 204 Anatomy for Paramedical Personnel 3
ANAT 204L Anatomy for Paramedical Personnel Laboratory 2
T&L 315 Education of Exceptional Students 3
SOC 326 Sociological Statistics 3

General Electives (chosen in consultation with adviser) 6

Total Credits 110

Bachelor of Arts with a Major in Music

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses

MUSC 203 Music and Culture 3
MUSC 310 Music History Survey I 6
& MUSC 311 and Music History Survey II 3
MUSC 490 Seminar in Music 3
MUSC 133 Keyboard Skills I 2
&MUSC 136 and Keyboard Skills II (or Piano Proficiency Level I & II)

Harmony and Theory Sequence

*MUSC 231 Aural Skills III 1
MUSC 235 Aural Skills IV 1

Supporting Courses in Music

Applied lessons (one instrument or voice) 8
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, & MUSC 399 Voice 4
&MUSC 140 and Special Topics

Piano Proficiency through Level IV or Keyboard Skills Sequence 4
MUSC 133 Keyboard Skills I
MUSC 136 Keyboard Skills II
MUSC 233 Keyboard Skills III
MUSC 236 Keyboard Skills IV

Major Ensembles (at least three different) 6
MUSC 256 Basic Conducting 2
MUSC 423 Instrumental and Choral Arranging 2
MUSC 340 Introduction to Music Technology 2

Music Therapy Courses

MUSC 180 Introduction to Music Therapy 3
MUSC 280 Music Therapy Clinical Skills 3
MUSC 281 Music Therapy Techniques I 2
MUSC 282 Music Therapy Practicum I 1
MUSC 380 Music Therapy Theories and Methods II (Adults) 3
MUSC 381 Music Therapy Techniques II 2
MUSC 382 Music Therapy Practicum II 1
MUSC 383 Music Therapy Practicum III 1
MUSC 480 Psychological Foundations of Music Learning 3
MUSC 481 Music Therapy Practicum IV 1
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PSYC 111 Introduction to Psychology 3
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ANAT 204L Anatomy for Paramedical Personnel Laboratory 2
T&L 315 Education of Exceptional Students 3
SOC 326 Sociological Statistics 3

General Electives (chosen in consultation with adviser) 6

Total Credits 110

Bachelor of Music with a Major in Music Therapy

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Review. Prior to entrance into Music Therapy Practicum courses (MUSC 282, MUSC 382, MUSC 383, MUSC 481), students are required to obtain statewide (MN and ND) and nationwide criminal history background checks with acceptable results. Background checks must be updated yearly. Contact your advisor for details.

Core Courses

MUSC 203 Music and Culture 3
MUSC 310 Music History Survey I 6
& MUSC 311 and Music History Survey II 3
MUSC 490 Seminar in Music 3

Harmony and Theory Sequence

MUSC 130 Music Theory I 3
MUSC 134 Music Theory II 3
MUSC 230 Music Theory III 3
MUSC 234 Music Theory IV: Music Theory since 1900 3

Aural Skills Sequence

MUSC 131 Aural Skills I 1
MUSC 135 Aural Skills II 1
MUSC 231 Aural Skills III 1
MUSC 235 Aural Skills IV 1

Supporting Courses in Music

Applied lessons (one instrument or voice) 8
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 150 Class Lessons 2
&MUSC 151 and Class Lessons 2
MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, & MUSC 399 Voice 4
&MUSC 140 and Special Topics

Piano Proficiency through Level IV or Keyboard Skills Sequence 4
MUSC 133 Keyboard Skills I
MUSC 136 Keyboard Skills II
MUSC 233 Keyboard Skills III
MUSC 236 Keyboard Skills IV

Major Ensembles (at least three different) 6
MUSC 256 Basic Conducting 2
MUSC 423 Instrumental and Choral Arranging 2
MUSC 340 Introduction to Music Technology 2

Music Therapy Courses

MUSC 180 Introduction to Music Therapy 3
MUSC 280 Music Therapy Clinical Skills 3
MUSC 281 Music Therapy Techniques I 2
MUSC 282 Music Therapy Practicum I 1
MUSC 380 Music Therapy Theories and Methods II (Adults) 3
MUSC 381 Music Therapy Techniques II 2
MUSC 382 Music Therapy Practicum II 1
MUSC 383 Music Therapy Practicum III 1
MUSC 480 Psychological Foundations of Music Learning 3
MUSC 481 Music Therapy Practicum IV 1
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Additional Required Courses

PSYC 111 Introduction to Psychology 3
PSYC 250 Developmental Psychology 4
PSYC 270 Abnormal Psychology 3
ANAT 204 Anatomy for Paramedical Personnel 3
ANAT 204L Anatomy for Paramedical Personnel Laboratory 2
T&L 315 Education of Exceptional Students 3
SOC 326 Sociological Statistics 3

General Electives (chosen in consultation with adviser) 6

Total Credits 110
College of Education and Human Development

Minor in Music

Required 26 credits:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 100 Introduction to the Understanding of Music</td>
<td>3</td>
</tr>
<tr>
<td><strong>Core Courses</strong></td>
<td></td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 131 Aural Skills I</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 310 Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 311 Music History Survey II</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Courses</strong></td>
<td></td>
</tr>
<tr>
<td>MUSC 490 Seminar in Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 491 Seminar</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 492 Senior Project</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 493 Special Projects</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Total Credits: 25-27

MUSC 100. Introduction to the Understanding of Music. 3 Credits.
Introduction of elements, genres, media, and historical and stylistic periods of music. Designed for the non-music major. F.S.

MUSC 101. Fundamentals of Music. 3 Credits.
Introduction to fundamental elements of music through the study of scales, chords, basic harmonic progressions, rhythms, and terminology. F.S.

MUSC 399. Special Topics. 1-3 Credits.
Specially arranged seminars or courses on variable topics not covered by regular departmental offerings. May be repeated for credit up to 6 hours. Prerequisite: Consent of instructor. Repeatable to 18 credits. F.S.

MUSC 490. Seminar in Music. 3 Credits.
A seminar on various topics in the history and literature of music. Final project will consist of a substantial research paper. Repeatable when topics vary. Prerequisites: Senior standing, MUSC 310, and MUSC 311. Repeatable. S.

MUSC 491. Seminar. 3 Credits.
Prerequisite: Instructor consent. On demand.

MUSC 492. Senior Project. 2 Credits.
Presentation of a recital, research paper, original composition, or similar project that meets the approval of the department. Prerequisite: Senior standing. F.S.

MUSC 493. Special Projects. 1-3 Credits.
Individual study in an approved area of interest to the student. May be repeated for credit up to 8 hours. Repeatable to 8 credits. F.S.

College of Arts and Sciences

Minor in Music

Required 21 credits:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 100 Introduction to the Understanding of Music (May be waived by examination)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Core Courses</strong></td>
<td></td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 131 Aural Skills I</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 310 Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>or MUSC 311 Music History Survey II</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Courses in Music</strong></td>
<td></td>
</tr>
<tr>
<td>Performance (Applied Music, Conducting, Ensembles)</td>
<td>4</td>
</tr>
<tr>
<td>Electives in History/Literature/Theory/Composition (May include, but not limited to, other courses in Music Major Core, such as the following:)</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 203 Music and Culture</td>
<td></td>
</tr>
<tr>
<td>MUSC 230 Music Theory III</td>
<td></td>
</tr>
<tr>
<td>MUSC 234 Music Theory IV: Music Theory since 1900</td>
<td></td>
</tr>
<tr>
<td>MUSC 310 Music History Survey I</td>
<td></td>
</tr>
<tr>
<td>MUSC 311 Music History Survey II</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 24

MUSC 130. Music Theory I. 3 Credits.
The study of diatonic harmonic and melodic principles of Western European music from 1600 to 1900. Topics include harmonic progressions, melodic patterns, rhythmic patterns, and voice leading. Material is learned through part writing, keyboard skills, and music analysis. Corequisite: MUSC 131. F.

MUSC 131. Aural Skills I. 1 Credit.
Training in reading at sight and in aural recognition involving dictation, keyboard, and singing skills. Corequisite: MUSC 130. F.

MUSC 133. Keyboard Skills I. 1 Credit.
Beginning classroom instruction in keyboard. Prerequisite: Open to Music majors or permission of department. F.

MUSC 134. Music Theory II. 3 Credits.
The continuation of diatonic materials from Music Theory I with an introduction to chromatic materials. Material is learned through part writing, keyboard skills, and music analysis. Prerequisite: MUSC 130 with a grade of C or better. Corequisite: MUSC 135. S.

MUSC 135. Aural Skills II. 1 Credit.
Training in reading at sight and in aural recognition involving dictation, keyboard, and singing skills. Prerequisite: MUSC 131 with a grade of C or better. Corequisite: MUSC 134. F.
MUSC 136. Keyboard Skills II. 1 Credit.
Intermediate classroom instruction in keyboard. Prerequisite: MUSC 133 with a grade of C or better. S.

MUSC 230. Music Theory III. 3 Credits.
The continued study of chromatic materials covered in MUSC 134. Material is learned through part writing, keyboard skills, and music analysis. Prerequisites: MUSC 133 and MUSC 134, with a grade of C or better. Corequisite: MUSC 231. F.

MUSC 231. Aural Skills III. 1 Credit.
Continuation of the development of sight reading and aural recognition skills including music dictation. Prerequisites: MUSC 135 with a grade of C or better. Corequisite: MUSC 230. F.

MUSC 233. Keyboard Skills III. 1 Credit.
Continuation of the development of fundamental piano skills with emphasis on the improvement of keyboard technique and repertoire. Prerequisites: MUSC 136 with a grade of C or better. F.

MUSC 234. Music Theory IV: Music Theory since 1900. 3 Credits.
Music thought, techniques, and theories of the 20th century and beyond. Material is learned through musical analysis and organ compositional. Prerequisite: MUSC 230 with a grade of C or better. Corequisite: MUSC 235. S.

MUSC 235. Aural Skills IV. 1 Credit.
Continuation of the development of sight reading and aural recognition skills including music dictation. Prerequisite: MUSC 231 with a grade of C or better. Corequisite: MUSC 234. S.

MUSC 236. Keyboard Skills IV. 1 Credit.
Continuation of the development of fundamental piano skills with emphasis on the improvement of keyboard technique and repertoire. Prerequisite: MUSC 233 with a grade of C or better. S.

MUSC 423. Instrumental and Choral Arranging. 2 Credits.
Scoring techniques for instrumental and vocal ensembles, including band, orchestra, jazz ensemble, choir and children’s chorus. Specific areas of focus to be determined by abilities and interests of the students. Prerequisite: MUSC 134. F, odd years.

MUSC 426. Electronic Music. 3 Credits.
Electronic music composition and sound synthesis using digital synthesizers and processors, recording equipment, and computers. Study of technological developments, important recordings, styles, composers, and trends. On demand.

MUSC 427. Analysis of Musical Form. 2 Credits.
Analysis of the principal forms of musical composition. Prerequisite: MUSC 230. S, even years.

MUSC 428. Counterpoint. 2 Credits.
Analysis and construction of basic counterpoint. Prerequisite: MUSC 230. F, even years.

MUSC 429. Composition. 2 Credits.
Original composition in smaller forms for vocal and instrumental solos and ensembles. Prerequisite: MUSC 234 or instructor permission. F.

MUSC 430. Composition Lessons. 1 Credit.
Individual or small group instruction in music composition. Repeatable. Prerequisite: MUSC 429 or instructor permission. Repeatable. F,S.

Music History and Literature

MUSC 200. Music in America. 3 Credits.
A historical survey of music in America from pre-colonial times through the twentieth century, including Classical, Ethnic, Folk, and Popular Traditions. Designed for non-majors; will include listening techniques and writing about music. On demand.

MUSC 201. Rock and Roll History. 3 Credits.
This class will give students a general, but in-depth survey of the major styles, periods, and influence-streams that make up the extremely large and varied category of “Rock” music. The course covers many styles, but the focus is on English-language mainstream popular music, produced between ca. 1954 and the present. Other important sub-genres will also be explored, including Motown, progressive rock, folk rock, funk, punk rock, country, and rap. SS.

MUSC 203. Music and Culture. 3 Credits.
Exploration of how human culture is expressed through music. Open to music majors only. Prerequisite: Music majors only. S, even years.

MUSC 276. Collegium Musicum. 1-4 Credits.
Study and performance of vocal and instrumental music of the Medieval, Renaissance, and Baroque eras, and other selected compositions which are rarely performed. Repeatable to 8 credits. On demand.

MUSC 310. Music History Survey I. 3 Credits.
A historical survey of western art music from Ancient Times to 1650. Prerequisite: MUSC 134 or instructors permission. F.

MUSC 311. Music History Survey II. 3 Credits.
A historical survey of western art music from 1650 to the present. Prerequisites: MUSC 133 and MUSC 134 or permission of instructor. S.

MUSC 414. Piano Literature. 3 Credits.
Study and analysis of keyboard music from the Baroque period to the present, with attention to the development of forms, techniques, and styles. Prerequisite: Piano, MUSC 354 or MUSC 355, or consent of instructor. S, even years.

MUSC 415. Vocal Literature. 3 Credits.
An historical overview of the development of art song and opera incorporating reading, listening, score study and analysis. Prerequisites: MUSC 284 and MUSC 285. F, odd years.

MUSC 416. Choral Literature. 2-4 Credits.
Choral literature from the Renaissance to the present with particular attention given to the representative compositions in both large and small forms. Prerequisites: Three hours of Music History and Literature. F, odd years.

MUSC 417. Instrumental Literature. 2 Credits.
Wind instrument literature from the Renaissance to the present with particular attention given to the representative compositions in both large and small forms. F, even years.

Music Therapy

MUSC 180. Introduction to Music Therapy. 3 Credits.
An overview of the field of music therapy, an introduction to its history and principles, different therapy models and techniques, and common populations served by the discipline. This course is open to all students interested in learning more about the field. S.

MUSC 280. Music Therapy Clinical Skills. 3 Credits.
An introduction to basic counseling skills and group leadership skills, study of the specific therapeutic uses of music, of the components of the treatment plan, and ethical considerations in the field. Prerequisites: MUSC 180 and the successful completion of the Sophomore Review as described in the Academic Catalog; department consent required. F.

MUSC 281. Music Therapy Techniques I. 2 Credits.
Basic therapeutic instrument mastery of guitar, autoharp, percussion and Orff instruments, tuning and maintenance, repertoire learning, developing basic vocal and percussion improvisation and songwriting skills, designing therapeutic interventions. Prerequisites: MUSC 180 and the successful completion of the Sophomore Review as described in the Academic Catalog; department consent required. S.

MUSC 282. Music Therapy Practicum I. 1 Credit.
Supervised field experience co-facilitating sessions for special populations in the community. In addition to clinical work, students attend an on-campus seminar. Prerequisites: Statewide (MN ND) nationwide background checks with acceptable results within 1 year prior to the beginning of class, MUSC 180 and the successful completion of the Soph Review as described in the Academic Catalog; dept consent req. F,S.

MUSC 380. Music Therapy Theories and Methods II (Adults). 3 Credits.
In-depth demonstration, analysis and comparison of specific music therapy models, a study of the theories, methods and techniques associated with these models, with special emphasis on the treatment of adults. Prerequisite: MUSC 280. S.

MUSC 381. Music Therapy Techniques II. 2 Credits.
Supervised field experience for special populations in the community. In addition to clinical work, students attend an on-campus seminar. Prerequisite: Statewide (MN ND) nationwide background checks with acceptable results within one year prior to the beginning of class, and MUSC 282. F,S.
MUSC 383. Music Therapy Practicum III. 1 Credit.
Supervised field experience co-facilitating sessions for special populations in the community. In addition to clinical work, students attend an on-campus seminar. Prerequisites: (Statewide (MN and ND) and nationwide background checks with acceptable results within one year prior to the beginning of class, and MUSC 382. F.S.

MUSC 397. Cooperative Education in Music. 1-3 Credits.
This course is intended for music therapy internship and for students seeking cooperative placements in the field of music. All placements will be conducted under the supervision of an appropriate music professional. Arranged by mutual agreement between student, department and placement supervisor. Repeatable to 3 credits. S/U grading. F.S.S.

MUSC 480. Psychological Foundations of Music Learning. 3 Credits.
An in-depth study of the psychological foundations of musical behavior including human response to music, music preference and ability; psychoacoustical parameters; and research in the field. Prerequisites: MUSC 383 and SOC 326. S, even years.

MUSC 481. Music Therapy Practicum IV. 1 Credit.
Supervised field experience co-facilitating sessions for special populations in the community. In addition to clinical work, students attend an on-campus seminar. Prerequisites: Statewide (MN and ND) and nationwide background checks with acceptable results within one year prior to the beginning of class, and MUSC 383. F.S.

MUSC 497. Music Therapy Internship. 1-3 Credits.
The internship is a degree requirement, offering the student supervised field experience under the guidance of a professional music therapist. Prerequisite: Completion of all music therapy coursework (see department for approval). Repeatable to 3 credits. S/U grading. F.S.S.

Music Education

MUSC 140. Methods: Woodwinds, Brass, Strings, Percussion, Voice. 1 Credit.
Offers music education students performance and pedagogical instruction on voice and instruments in the brass, woodwind, string and percussion families. Repeatable to 6 credits. Prerequisite: Music majors and minors only. Repeatable to 6 credits. F.S.

MUSC 340. Introduction to Music Technology. 2 Credits.
Introduction to the use of the World Wide Web, computers and synthesizers, samplers, and computer assisted instruction software in composition, performance and music education. Prerequisites: MUSC 134 and MUSC 135. S.

MUSC 440. Methods and Materials for Elementary Music. 3 Credits.
Overview of methods and materials in elementary music for music majors and minors. Includes experiences for the practical application of course content. Corequisite: T&L 386. F.

MUSC 441. Methods and Materials for Middle and Secondary School Music. 3 Credits.
Strategies and materials used in teaching music in middle and secondary schools with emphasis on integration and practical application of course content and continuing development of professional music teaching competencies. Prerequisites: Admission to Teaching and Learning, passed Music Sophomore Review, and 75 total credit hours. Corequisite: T&L 486. S.

MUSC 442. Music for Elementary School Teachers. 3 Credits.
Survey of elementary school music. Development of teacher skills and knowledge emphasizing conceptual understandings and music competencies essential in the musical growth of children. Prerequisite: Admissions to Teacher Education; not open to music majors or minors. F.S.

MUSC 443. Music Methods and Materials for Elementary School Teachers. 3 Credits.
An overview of elementary methods and materials for non-majors with a musical background. S, odd years.

MUSC 445. Choral Methods For Directors. 3 Credits.

MUSC 446. Instrumental Classroom Methods and Materials. 3 Credits.
F, odd years.

MUSC 447. Jazz Pedagogy. 2 Credits.
Organization of and materials appropriate for the jazz band, methods of teaching the rhythmic and tonal problems inherent in its style. On demand.

MUSC 448. Orchestra Directors' Course. 1 Credit.
Organizational and administrative problems of the orchestra director such as curriculum, recruiting, scheduling, programming, promotion of the string program, and literature. On demand.

MUSC 449. Music Education Special Topics. 1-3 Credits.
Repeatable to 3 credits. F.S.

Music Performance

a. Conducting

MUSC 256. Basic Conducting. 2 Credits.
Development of basic conducting techniques, baton technique, and use of the left hand. Reading of choral and instrumental scores. Prerequisites: MUSC 130. F.

MUSC 357. Choral Conducting. 2 Credits.
Conducting problems and rehearsal techniques in relation to choral literature in various styles based on score, class performance, and recordings. Prerequisites: MUSC 236 and MUSC 256. S, odd years.

MUSC 358. Instrumental Conducting. 2 Credits.
Instrumental conducting, rehearsal techniques, and score reading through the use of instrumental literature of various styles and periods. Prerequisite: MUSC 256. S, even years.

b. Pedagogy

MUSC 444. Applied Music Pedagogy. 2 Credits.
Readings, instruction, and application of pedagogical principles and materials relevant to the student's major instrument(s). May be repeated for credit up to 6 hours. Prerequisite: Four semesters of Applied Music in the instrument (or voice) concerned or consent of instructor. Repeatable to 6 credits. On demand.

c. Music Ensembles

IMPORTANT NOTICE: A MAXIMUM OF TWELVE HOURS OF CREDIT IN ENSEMBLES MAY APPLY TOWARDS GRADUATION.

MUSC 260. Concert Choir. 1 Credit.
Select mixed choir performing the finest choral literature from every historical era. Repeatable to 12 credits. F.S.

MUSC 261. University Chamber Choir. 1 Credit.
Select small mixed choir focusing on a different kind of choral music every semester, from early music to jazz and theater. Repeatable to 12 credits. F.S.

MUSC 263. Varsity Bards Men's Chorus. 1 Credit.
Men's vocal ensemble specializing in traditional shorter choral works, folk songs, spirituals, and lighter fare. Repeatable to 12 credits. F.S.

MUSC 264. Women's Chorus. 1 Credit.
Women's vocal ensemble specializing in traditional shorter choral works, folk songs, spirituals, and lighter fare. Repeatable to 12 credits. F.S.

MUSC 266. Old English Christmas Feast. 1 Credit.
Participation in all scheduled activities for the Old English Christmas Feast, to include singing (large groups and strolling minstrels), serving meals, acting, and ushering. Repeatable to 12 credits. F.

MUSC 269. Opera Workshop. 1 Credit.
Production and presentation of chamber operas, scenes from larger works, and major productions, fully staged and costumed. Repeatable to 12 credits. On demand.

MUSC 270. Wind Ensemble. 1 Credit.
Select ensemble of wind and percussion students performing the finest concert band literature. Repeatable to 12 credits. F.S.

MUSC 271. University Band. 1 Credit.
Concert band open to all university students without audition, performing a wide variety of contemporary band literature. Repeatable to 12 credits. F.S.

MUSC 272. Marching/Athletic Band. 1 Credit.
The Pride of the North Band is open to all students on campus, and performs on the field and in the stands at all home games for the UND football, men's and women's basketball, and hockey teams. Repeatable to 12 credits. F.S.

MUSC 273. Instrumental Jazz Ensemble. 1 Credit.
Big band jazz ensemble performing music ranging from the swing era to the sounds of today. Repeatable to 12 credits. F.S.
d. Applied Music (Group Instruction)

MUSC 150. Class Lessons. 1 Credit.
Beginning class instruction in any of the following instrumental classes: Brass, Woodwind, Percussion, and String Class; Piano Class; Voice Class; Guitar Class. May be repeated for credit without limitation. Repeatable. F.S.

MUSC 151. Class Lessons. 1 Credit.
Intermediate class instruction in any of the following instrumental classes: Brass, Woodwind, Percussion, and String Class; Piano Class; Voice Class; Guitar Class. May be repeated for credit without limitation. Repeatable. F.S.

MUSC 152. Class Guitar for Music Majors. 1 Credit.
Beginning class instruction on guitar for music majors. Prerequisite: Instructor permission. F.

MUSC 242. Diction for Singers. 1 Credit.
Rules for and practical application of two of the major languages used in song literature: Italian/English or French/German. May be repeated for credit up to 2 hours when topics vary. Offered Fall odd years and Spring even years. Prerequisite: Two semesters of private voice lessons.

MUSC 252. Class Guitar for Music Majors. 1 Credit.
Intermediate class instruction on guitar for music majors. Prerequisites: MUSC 152 and permission of instructor. S.

e. Applied Music (Individual Lessons*)

MUSC 153. Individual Lessons for Non-Majors. 1 Credit.
Beginning college-level applied study of the stated instrument or voice, for non-Music majors, Half hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Repeatable. Does not count toward music degree credit. Prerequisites: MUSC 154 and permission of instructor. Repeatable to 12 credits. F.S.

MUSC 154. Individual Lessons. 1 Credit.
Applied study of the stated instrument or voice at the freshman level. Half hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Prerequisites: MUSC 153 and permission of instructor. Repeatable to 12 credits. F.S.

MUSC 155. Individual Lessons. 2 Credits.
Applied study of the stated instrument or voice at the freshman level for Bachelor of Music in Performance students and others. One-hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Course is repeatable. Prerequisites: Permission of the instructor. Repeatable. F.S.

MUSC 156. Individual Lessons. 1 Credit.
Intermediate college-level applied study of the stated instrument or voice, for non-Music majors. Half hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Repeatable. Does not count toward music degree credit. Prerequisites: MUSC 153 and permission of instructor. Repeatable to 12 credits. F.S.

MUSC 157. Individual Lessons. 3 Credits.
Applied study of the stated instrument or voice at the sophomore level for Bachelor of Music in Performance students and others. One-hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Course is repeatable. Prerequisites: MUSC 156 and permission of the instructor. Repeatable. F.S.

MUSC 158. Individual Lessons. 4 Credits.
Applied study of the stated instrument or voice at the junior level. Half hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Course is repeatable. Prerequisites: MUSC 157 and permission of the instructor. Repeatable. F.S.

MUSC 159. Junior Recital. 1 Credit.
Presentation of Junior Recital. No regular student may take an Applied Music course without credit or on other than a letter grade basis. Prerequisite: MUSC 254 or MUSC 255. Corequisite: MUSC 354 or MUSC 355. S/U grading. F.S.

MUSC 454. Individual Lessons. 1 Credit.
Applied study of the stated instrument or voice at the senior level. Half hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Prerequisites: MUSC 354 and permission of instructor; open to Music Education, Music Therapy, Music Majors, and Music Minors only. Repeatable. F.S.

MUSC 455. Individual Lessons. 4 Credits.
Applied study of the stated instrument or voice at the senior level for Bachelor of Music in Performance students and others. One-hour lesson. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis. Course is repeatable. Prerequisites: MUSC 354 and permission of the instructor; open to Music Education, Music Therapy, Music Majors, and Music Minors only. Repeatable. F.S.

MUSC 459. Senior Recital. 1-2 Credits.
The presentation of a senior recital. No regular student may take an Applied Music course without credit or on other than a letter grade basis. Prerequisite: MUSC 354 or MUSC 355. Corequisite: MUSC 454 or MUSC 455. S/U grading. F.S.

* In registering for private lessons in voice, piano, organ, or any band or orchestra instrument, "Voice" or the name of the instrument serves as the title of the course. An audition with appropriate Music Faculty is a prerequisite for all students’ enrollment in Individual Lessons. For the final examination, the student will perform before a faculty committee (jury). No regular student may take an Applied Music course without credit or on other than a letter grade basis.
Nonprofit Leadership Program (NLP)

http://www.und.edu/dept/lcp/

Heather Helgeson (Program Director)

The Nonprofit Leadership Program is a multidisciplinary program within the College of Business and Public Administration. This program is primarily directed toward students who want to acquire skills and enhance their qualifications for service in the nonprofit sector.

The program corresponds well with the Nonprofit track of the Public Administration Major.

The Nonprofit Leadership Program offers two course options, an 18-credit Certificate in Nonprofit Leadership, or a 21-credit Minor in Nonprofit Leadership. Both programs complement any major area of study. The program will develop students' competencies in understanding nonprofit organizations, the role of meeting human needs, and the diversity of groups in society. Students acquire the competencies for this program through coursework as well as hands-on learning through service work in the community and internships with nonprofit organizations.

The Nonprofit Leadership Program is affiliated with The Nonprofit Leadership Alliance, a national organization that establishes competencies and affiliates with nonprofit leadership programs in colleges and universities and awards all graduates of Alliance Campus programs, the Certified Nonprofit Professional credential.

The Certified Nonprofit Professional (CNP). Awarded to all graduates of Alliance campus programs, the CNP is the first national professional designation of its kind.

The CNP demonstrates that a job candidate possesses critical competencies nonprofits look for when hiring.

- See more at: CNP (http://www.nonprofitleadershipalliance.org/cnp/cnp.html#sthash.LqpAo34Ndpuf)

College of Arts & Sciences

Minor in Nonprofit Leadership

Core Requirements

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<thead>
<tr>
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<tbody>
<tr>
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<td>A&amp;S 450</td>
<td>Capstone Experience and Development for Nonprofit</td>
<td>3</td>
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<td>A&amp;S 497</td>
<td>Internship</td>
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<tr>
<td>POLS 361</td>
<td>Nonprofit Management (Undergrad)</td>
<td>3</td>
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<tr>
<td>Electives (see course list below)</td>
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Total Credits: 19-21

Elective courses for the Certificate and Minor in Nonprofit Leadership. Choose one 3-credit course from each area.

Select one from each of the following:

Organizational

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<tr>
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<tr>
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<tr>
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<td>Entrepreneur Law &amp; Operations</td>
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<td>A&amp;S 294</td>
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<td>PSYC 301</td>
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Service and Community

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<td>Helping Skills in Community Services</td>
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<tr>
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Diversity

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<td>3</td>
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<tr>
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<td>Culture, Illness and Health</td>
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<td>IDS 495</td>
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Certificate in Nonprofit Leadership

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Total Credits: 16-18

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**Introduction to Gender Studies**

**Culture Area Studies**

**Introduction to Cultural Anthropology**

**Music and Culture**

**The Study of Women**

**Introduction to Ethics**

**Pre-Nursing Declaration**

During the completion of courses in the pre-nursing curriculum, they will be assigned. Students must maintain an overall GPA of 2.75 in order to continue.

**Disciplines.** Once the student has successfully been admitted to UND as a student who wish to pursue an undergraduate degree in nursing must first access the UND Nursing Program Application located on the nursing website. Approximately 50-60 students are admitted each semester based on availability of clinical and faculty resources. The nursing program admits students who meet criteria for direct admission and standard admission. Application criteria is listed below.

**Direct Admission Application and Progression criteria:**

Direct admission is a criterion-based early admission program for pre-nursing students who have exemplary academic performance during high school. Direct admission will be limited to the top 20 qualified candidates. Direct admissions will occur once per academic year in the fall semester. Students who are not selected for direct admission must apply for admission to the traditional BSN program through the standard admission process.

**Admission Criteria for Direct Admission (students must meet all criteria):**

- High school GPA of 3.5 or higher.
- Composite ACT score of at least 27 or a combined SAT score of at least 1210 in the previous 2 years.
- Preference will be given to those students graduating from a ND high school.
- Declared intent to pursue a baccalaureate degree in nursing on UND admission application.
- Admission to the University of North Dakota as a full-time freshman.
- Declared intent to pursue a baccalaureate degree in nursing on UND application.
- No transfer students will be admitted through direct admission.
- Direct Admission will be limited to the 20 students with the highest combined high school GPA and ACT or SAT scores. In the event of a tie, admission will be determined by random selection.

**Progression Criteria for Direct Admission Students:**

- Maintain a cumulative GPA of 3.5 in all UND undergraduate coursework until admission to the nursing program.
- Minimum grade of B or higher in all core courses.
  - English Composition 130
  - Psychology 111
  - Sociology 110 or 115 or Anthropology 171
  - Chemistry 116/Lab Organic Biochemistry (or Chemistry 122/Lab & Biology 150, 151/Labs)
  - Anatomy 204 (Human Anatomy) and 204 Lab
- Obtain a C or higher in all other prerequisite nursing coursework.
- No withdrawals or repeats will be allowed in any nursing prerequisite coursework.
- Application submission to the Traditional On-Campus BSN program in the fall of their second undergraduate academic year for Spring admission.
- Students with direct admit status who fail to meet progression criteria may apply through standard admission process.

**Standard Admission Application Criteria:**

The nursing program admits students twice during the calendar year. The application deadline is February 1 (for admission to fall class), and July 1 (for admission to spring class). The application process is online and may be accessed at: http://www.nursing.und.edu/application/.

**Admission Criteria for Standard Admission (students must meet all criteria):**

- Admission to the University of North Dakota.
- A minimum cumulative and UND grade point average of 2.75.
- Achieve minimum score of “Proficient” on Assessment Technologies Institute ( ATI) Test of Essential Academic Skills ( TEAS) test (Information located on nursing website).
• Completion of the following courses or equivalents with a letter grade of a C or better:
  a. English 110
  b. *English Composition 130
  c. *Psychology 111
  d. *Sociology 110 or 115 or Anthropology 171
  e. Chemistry 115 & Lab or Chemistry 121 & Lab
  f. *Chemistry 116/Lab Organic Biochemistry (or Chem122/Lab & Biology 150 & 151 & Labs)
  g. *Anatomy 204 (Human Anatomy) and 204 lab
  h. Math 103 College Algebra
  i. Abnormal Psychology 270 or Developmental Psychology 250
  j. Microbiology 202/lab
  k. *Human Physiology 301

I. Completion of the following courses with a grade of "C" or better prior to beginning nursing courses:
   i. Statistics
   ii. Pharmacology 315
   iii. Nutrition 240
   iv. Developmental Psychology 250 or Abnormal Psychology 270

*Core courses used in admission calculation.

• Core nursing prerequisite coursework may be repeated or withdrawn from a maximum of one time per course.

ENGL 110 College Composition I 3
ENGL 130 Composition II: Writing for Public Audiences * 3
CHEM 115 Introductory Chemistry 4
& 115L and Introductory Chemistry Laboratory
or CHEM 121 General Chemistry I & 121L and General Chemistry I Laboratory
CHEM 116 Introduction to Organic and Biochemistry 4
& 116L and Introduction to Organic and Biochemistry Laboratory
ANAT 204 Anatomy for Paramedical Personnel 5
& 204L and Anatomy for Paramedical Personnel Laboratory *
PSYC 111 Introduction to Psychology * 3
SOC 110 Introduction to Sociology 3
or ANTH 171 Introduction to Cultural Anthropology
or SOC 115 Social Problems
PSYC 250 Developmental Psychology 4
or PSYC 270 Abnormal Psychology
MATH 103 College Algebra 3
MBIO 202 Introductory Medical Microbiology Lecture 3
MBIO 202L Introductory Medical Microbiology Laboratory 2
PPT 301 Human Physiology 4

* Refers to courses which are used in the "core" grade point average (GPA) calculation for admission.

Admission Acceptance Criteria

Upon notice of admission to the Traditional BSN On-Campus Nursing Program, students must submit the signed admission acceptance form and a non-refundable deposit by the date indicated on the Admission Acceptance form. The non-refundable deposit will be applied to the first semester of nursing program fees. Failure to return the acceptance form and deposit by deadline will result in loss of nursing placement. Current verifications and a designated background check, with acceptable results, will be required. Details regarding required immunizations and background check process will be provided in the admission packet.

The following courses or equivalents must be completed with a "C" or better prior to beginning nursing courses:

PSYC 270 Abnormal Psychology 7
& PSYC 250 and Developmental Psychology
N&D 240 Fundamentals of Nutrition 3
PPT 315 Human Pharmacology 3
SOC 326 Sociological Statistics 3
or PSYC 241 Introduction to Statistics
or ECON 210 Introduction to Business and Economic Statistics

NOTE: Students will be automatically assigned to the UND catalog active at the time of admission to the Nursing program unless they request otherwise.

Students may petition to establish credit through special examinations according to University policy. Equivalency of courses taken on other campuses than UND should be verified by contacting the College of Nursing and Professional Disciplines as early as possible.

Admission Criteria for Transfer Nursing Students:

Students transferring to the nursing major from other accredited nursing programs must fulfill the same minimum prerequisite requirements as current University of North Dakota students. Transfer nursing students seeking admission to the UND nursing program must meet UND and standard admission criteria. Additional prerequisite courses will be required in accordance with the level of requested admission. Transfer nursing students must provide a letter of good standing from their prior nursing program. During the admission process, the student’s transfer work will be evaluated.

Additional Expenses

In addition to the regular university tuition and fees, nursing students are charged a nursing program fee each semester. Costs of laboratory tests, immunizations, and health insurance required for the protection of the student and patients are the responsibility of the student. There are additional expenses related to background checks, uniforms and clinical equipment, graduation, and licensure. An estimated program cost sheet is available from the College of Nursing and Professional Disciplines web pages. Students are responsible for transportation related to clinical experience. Use of a car, especially for public health nursing, is necessary. Students may complete the practicum course at a distant site which will require travel and housing costs associated with that affiliation.

Standardized Testing

To facilitate success on the licensure exam, students participate in standardized testing as they progress through the curriculum and prior to graduation.

Curriculum

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies (ES) Requirements, including 9 credits of Fine Arts and Humanities and 9 credits of Communication. A minimum of six (6) credits of the Essential Studies requirements must meet the US and Global Diversity designations (See University ES listing on web). The curriculum provides a framework for completion of ES requirements prior to beginning the undergraduate nursing curriculum. Completion of ES and general education requirements prior to beginning nursing courses is strongly encouraged.

II. A minimum overall grade point average of 2.75.

III. The following curriculum:

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
<td>4</td>
</tr>
</tbody>
</table>
& 115L & 115L | Introductory Chemistry Laboratory | 5       |
| PSYC 111    | Introduction to Psychology | 3       |
| MATH 103    | College Algebra | 3       |
| MBIO 202    | Introductory Medical Microbiology Lecture | 3       |
| MBIO 202L   | Introductory Medical Microbiology Laboratory | 2       |
| PPT 301     | Human Physiology | 4       |

Credits 16
### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 116 &amp; 116L</td>
<td>Introduction to Organic and Biochemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 204 &amp; 204L</td>
<td>Anatomy for Paramedical Personnel Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>SOC 110 or ANTH 171</td>
<td>Introduction to Sociology or Introduction to Cultural Anthropology</td>
<td>3</td>
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</table>

Total Credits: 15

### Sophomore Year

#### First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>MBIO 202 &amp; 202L</td>
<td>Introductory Medical Microbiology Lecture and Introductory Medical Microbiology Laboratory (fall only)</td>
<td>5</td>
</tr>
<tr>
<td>PSYC 270 or PSYC 250</td>
<td>Abnormal Psychology or Developmental Psychology</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking (Oral Communication requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Essesntial Studies: Arts/Humanities</td>
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Total Credits: 18

#### Second Semester

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PPT 315</td>
<td>Human Pharmacology (On campus in Spring only or online)</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 250 or PSYC 270</td>
<td>Developmental Psychology or Abnormal Psychology</td>
<td>4</td>
</tr>
<tr>
<td>SOC 326 or PSYC 241 or ECON 210</td>
<td>Sociological Statistics or Introduction to Statistics or Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 240</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Essesntial Studies: Arts/Humanities</td>
<td></td>
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Total Credits: 16

### Junior Year

#### First Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 300</td>
<td>Foundations of Nursing Practice</td>
<td>5</td>
</tr>
<tr>
<td>NURS 301</td>
<td>Professional Nurse I</td>
<td>2</td>
</tr>
<tr>
<td>NURS 304</td>
<td>Nursing Pharmacology I</td>
<td>3</td>
</tr>
<tr>
<td>NURS 310</td>
<td>Health &amp; Illness I</td>
<td>2</td>
</tr>
<tr>
<td>NURS 312</td>
<td>Pathophysiology I</td>
<td>2</td>
</tr>
<tr>
<td>NURS 313</td>
<td>Clinical Practicum I</td>
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Total Credits: 16

#### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 390</td>
<td>Health &amp; Illness II</td>
<td>4</td>
</tr>
<tr>
<td>NURS 331</td>
<td>Patient &amp; Family-Centered Nursing</td>
<td>3</td>
</tr>
<tr>
<td>NURS 332</td>
<td>Pathophysiology II</td>
<td>2</td>
</tr>
<tr>
<td>NURS 333</td>
<td>Clinical Practicum II</td>
<td>4</td>
</tr>
<tr>
<td>NURS 334</td>
<td>Nursing Pharmacology II</td>
<td>2</td>
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</table>

Total Credits: 15

### Senior Year

#### First Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 403</td>
<td>Nursing Across the Lifespan Practicum</td>
<td>2</td>
</tr>
<tr>
<td>NURS 404</td>
<td>Professional Nurse II</td>
<td>2</td>
</tr>
<tr>
<td>NURS 406</td>
<td>Evidence Informed Practice</td>
<td>2</td>
</tr>
<tr>
<td>NURS 420</td>
<td>Interprofessional Health Care</td>
<td>1</td>
</tr>
</tbody>
</table>

### Progression and Graduation Requirements

Students should note that nursing courses are sequenced to build on one another over four semesters. Careful attention should be paid to pre-and co-requisites. Each semester is to be completed in its entirety before progressing to the next semester. Students who need to extend or shorten the number of semesters to complete the curriculum, i.e., part-time attendance or LPNs, must see their OSS adviser.

1. A 2.75 overall GPA is required for progression in the nursing program at the end of each semester.
2. A student must attain a letter grade of at least a “C” in each of the courses required in the undergraduate nursing curriculum, including all the nursing and support courses, to progress to the next semester of nursing courses and for graduation from the College of Nursing and Professional Disciplines. A student earning a “D” or an “F” in any required nursing course may repeat the course only once.
3. A student may only repeat one required nursing course.
4. Benchmark scores on ATI progression assessments and predictor exam must be achieved or the remediation process successfully completed.

Students who do not meet the academic progression criteria will be placed on probation. The nursing program also reserves the right to place students on probation, to suspend, or to dismiss any student in nursing who does not meet the ATI content exam policy requirements, does not uphold professional standards or conduct, or whose performance in relation to client care is unsatisfactory. Additional details and any modifications in policies may be obtained from the Dean of the College, and are available in the College of Nursing and Professional Disciplines undergraduate student handbook.

### RN to BSN Online Option

The RN/BSN option is designed for students who hold an associate (diploma) degree or diploma in nursing and are seeking to obtain a baccalaureate degree in nursing. Students in the RN/BSN option program may attend classes either full or part-time. Thirty one semester credits of UND nursing coursework are required (see below). In addition, students must complete all UND Essential Studies requirements, RN/BSN program pre-requisites and UND graduation requirements. A minimum of 125 credits and a minimum overall grade point average of 2.75 are required for graduation. Online tuition/fees and the nursing program fee apply.

### RN to BSN Admission Process

Completed online applications received by July 1 will be considered for the following fall admission. Applications will be accepted once per calendar year.
Admission Application Criteria (Must be completed prior to application deadline):

- Admission to the University of North Dakota
- All transcripts from other universities or colleges must be submitted to the University of North Dakota
- Minimum 2.75 overall and UND GPA
- Submission of copy of a current, unencumbered RN license
- Completion of the following courses with a grade of “C” or better:
  - Important Deadlines
    - July 1: Applications for Fall Admission completed
    - July 1: Petitions pertaining to Fall Admission to the nursing program submitted in order to be considered

1. ENGL 110 College Composition I 6
   & ENGL 130 and Composition II: Writing for Public Audiences
   PSYC 111 Introduction to Psychology 3
2. PSYC 250 Developmental Psychology 4
3. SOC 110 Introduction to Sociology 3
   or SOC 115 Social Problems
   or ANTH 171 Introduction to Cultural Anthropology
4. ANAT 204 Anatomy for Paramedical Personnel 5
   & 204L and Anatomy for Paramedical Personnel Laboratory
5. PPT 301 Human Physiology 4
   MBIO 202 & 202L Introductory Medical Microbiology Lecture
   PPT 315 Human Pharmacology 3
6. NURS 282 Health Promotion 2
   NUTR 240 3
   or ANTH 171 Introduction to Anthropology
   or PSYC 241 Sociological Statistics 3
   or ECON 210 Introduction to Business and Economic Statistics

Admission Acceptance Criteria

Upon notice of admission to the RN to BSN Nursing Program, students must submit the signed admission acceptance form and a non-refundable deposit towards the first semester program fee by the date indicated on the Admission Acceptance form. Failure to return the acceptance form and deposit by deadline will result in loss of nursing placement. Current verifications and designated background check, with acceptable results, will be required and details are provided in admission letter. Prior to beginning the nursing program: Verifications must be completed and uploaded into verification tracker. Please refer to Undergraduate Nursing Student Handbook.

RN to BSN Curriculum

1. Total 31 credits
2. Two options:
   a. Full-time (completion in 12 months)
   b. Part-time (completion in 24 months)

Courses are offered online through distance delivery. NURS 374 Public Health Nursing Clinical course requires daytime clinical hours and can be conducted in a community near the student based on agency availability and UND nursing program approval. UND may not be able to accommodate clinical experiences in some states due to specific state board of nursing regulations. For additional information, contact the College of Nursing and Professional Disciplines or visit the RN/BSN area on the College website.

Full-time Curriculum

<table>
<thead>
<tr>
<th>Summer</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 324 Public Health Nursing Theory</td>
<td>2</td>
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<tr>
<td>NURS 374 Public Health Nursing Clinical</td>
<td>2</td>
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<tr>
<td>NURS 474 Professional Development II</td>
<td>5</td>
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<td>Total Credits</td>
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<table>
<thead>
<tr>
<th>Fall</th>
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</thead>
<tbody>
<tr>
<td>NURS 282 Health Promotion</td>
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<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>NURS 326 Evidence-Based Practice</td>
</tr>
<tr>
<td>NURS 405 Informatics in Nursing</td>
</tr>
<tr>
<td>NURS 415 Interprofessional Collaborations For Improving Health Care Systems Outcomes</td>
</tr>
<tr>
<td>NURS 490 Transcultural Health Care Theories, Research, and Practice</td>
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<tr>
<td>Total Credits</td>
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</table>

Part-time Curriculum

First Year

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 324 Public Health Nursing Theory</td>
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<tr>
<td>NURS 374 Public Health Nursing Clinical</td>
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<tr>
<td>Total Credits</td>
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<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>NURS 282 Health Promotion</td>
</tr>
<tr>
<td>NURS 350 Nursing in Transition</td>
</tr>
<tr>
<td>Total Credits</td>
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<table>
<thead>
<tr>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>NURS 326 Evidence-Based Practice</td>
</tr>
<tr>
<td>NURS 490 Transcultural Health Care Theories, Research, and Practice</td>
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<tr>
<td>Total Credits</td>
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Second Year

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>NURS 474 Professional Development II</td>
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<tr>
<td>Total Credits</td>
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<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>NURS 302 Pathophysiology</td>
</tr>
<tr>
<td>NURS 410 Clinical Reasoning for Safety and Quality Outcomes</td>
</tr>
<tr>
<td>Total Credits</td>
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<table>
<thead>
<tr>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 405 Informatics in Nursing</td>
</tr>
<tr>
<td>NURS 415 Interprofessional Collaborations For Improving Health Care Systems Outcomes</td>
</tr>
<tr>
<td>Total Credits</td>
</tr>
</tbody>
</table>

RN/BSN Progression and Graduation Requirements

Students should note that nursing courses are sequenced to build on one another. Careful attention should be paid to pre- and co-requisites. Enrollment may be either full- or part-time.

1. A 2.75 overall GPA is required for progression at the end of each semester.
2. A student must attain a letter grade of at least a “C” in each of the courses required in the undergraduate nursing curriculum, including all the nursing and support courses, to progress to the next semester of nursing courses and for graduation from the College of Nursing and Professional Disciplines.
3. A student earning a “D” or an “F” in any required nursing course may repeat that course only once.
4. A student may only repeat one required nursing course. Students who do not meet the academic progression criteria will be placed on probation. The nursing program also reserves the right to place students on probation, to suspend, or to dismiss any student in nursing who does not uphold...
Nursing (Nurs)

professional standards of conduct or whose performance in relation to client care is unsatisfactory. Additional details and any modifications in policies may be obtained from the Dean of the College, and are available in the College of Nursing and Professional Disciplines undergraduate student handbook.

RN/BSN students must meet all UND Essential Studies Requirements. This will typically include an additional three credits of Oral Communications, a three-credit Global Diversity course, and nine credits of Fine Arts and Humanities, for which online courses are available.

125 credits are required for graduation.

*60 credits must be completed at a four-year school.

36 credits must be upper division (300 level or above).

30 credits must be UND credits.

*NCLLEX credit

Thirty (30) credits will be awarded during the semester of graduation. These 30 credits are based on successful completion of the NCLEX examination. These 30 credits will be designated toward the required minimum of 60 credits at a 4 year institution.

Courses

NURS 282. Health Promotion. 2 Credits.
This course focuses on the promotion of health across the lifespan based on national health objectives. Lecture. Prerequisites: Nursing majors only. Prerequisites or corequisites: NURS 284 and NURS 303. F.S.

NURS 284. Functional Changes in Aging. 2 Credits.
This course deals with normal aging and the functional and psychosocial changes that occur. Lecture. Prerequisite or corequisite: Nursing major or Gerontology minor. F.S.

NURS 289. Professional Development I. 2 Credits.
An introduction to professional nursing practice is provided, with exploration of major factors guiding the practice of nursing. Lecture. Prequisite: Nursing major. F.S.

NURS 300. Foundations of Nursing Practice. 5 Credits.
This introductory nursing course combines basic health assessment skills with therapeutic interventions using a concept-based approach. Students will demonstrate cognitive and psychomotor competencies for the care of patients across the lifespan with emphasis on interviewing techniques, physical exam, and therapeutic skills performance. Awareness of cultural, developmental, and risk factors that affect the patient's health will be explored through classroom and laboratory experiences. Prerequisite: Admission to the undergraduate nursing program. Corequisites: NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. F.S.

NURS 301. Professional Nurse I. 2 Credits.
This introductory nursing course provides the foundation for learning about the behaviors and attributes of the professional nurse. Knowledge, skills and attitudes important for safe and effective nursing care are explored, including leadership, legal and ethical concepts, and interpersonal communication. Nursing values will be discussed with respect to the baccalaureate generalist practice role. Prerequisite: Admission to the undergraduate nursing program. Corequisites: NURS 300, NURS 304, NURS 310, NURS 312, and NURS 313. F.S.

NURS 302. Pathophysiology. 3 Credits.
The focus of this course is the application of concepts of altered health in the development of clinical manifestations of disease and illness. Lecture. Prerequisites: PPT 301 and Nursing major. F.S.

NURS 303. Assessment Across the Lifespan. 4 Credits.
Application of scientific principles in holistic assessment of infants, children, and adults. Lecture/Lab. Prerequisites: PPT 301 and Nursing major. Corequisites: NURS 292, NURS 294 and NURS 302. F.S.

NURS 304. Nursing Pharmacology I. 3 Credits.
This is the first in a two part series of courses that reinforces the concepts of pharmacokinetics, pharmacodynamics, and introduces safe medication preparation, administration and documentation. Using a concept-based approach, examples of medications as they relate to major nursing concepts and human body systems across the lifespan will be discussed. This course will include classroom and laboratory experiences. Prerequisites: Admission to the undergraduate nursing program and PPT 315. Corequisites: NURS 300, NURS 301, NURS 310, NURS 312, and NURS 313. F.S.

NURS 310. Health & Illness I. 2 Credits.
This course introduces the student to the role of the generalist nurse in providing evidence-based interventions for patients in a variety of health care settings across the life span. The student will learn to recognize altered health states and understand interventions that will promote health, prevent disease/injury and restore a state of optimal health for individuals. Clinical reasoning skills will be developed, with a goal of achieving safe, quality outcomes. Prerequisite: Admission to the undergraduate nursing program. Corequisites: NURS 300, NURS 301, NURS 304, NURS 312, and NURS 313. F.S.

NURS 312. Pathophysiology I. 2 Credits.
This is the first in a two part series of courses that focuses on the concepts of altered health in the development of clinical manifestations of disease and illness throughout the lifespan. This course will explore altered function and structure of the human body using a conceptual approach. Prerequisite: Admission to the undergraduate nursing program. Corequisites: NURS 300, NURS 301, NURS 304, NURS 310, and NURS 313. F.S.

NURS 313. Clinical Practicum I. 2 Credits.
This clinical course initiates the student's journey in developing the generalist role as a provider of care. The student will learn to apply evidence-based knowledge, skills, attitudes and patient care technologies that will promote a state of optimal health for their patients. Students will professionally interact with individuals across the lifespan and in diverse populations to provide safe, quality and patient-centered care. Prerequisite: Admission to the undergraduate nursing program. Corequisites: NURS 300, NURS 301, NURS 304, NURS 310, and NURS 312. F.S.

NURS 321. Nursing Procedures. 2 Credits.
Acquisition and application of foundational nursing procedures supported by the nursing process and theoretical concepts. Lecture/lab. Prerequisites: NURS 282, NURS 289, NURS 302 and NURS 310. Prerequisites or corequisites: NURS 371 and PPT 315. F.S.

NURS 322. Communication, Diversity, Families. 3 Credits.
This course introduces students to elements of the nurse patient relationship, the assessment of diverse families, use of therapeutic communication, and application of transcultural concepts. Lecture. Prerequisites: NURS 282, NURS 284, NURS 289, NURS 302 and NURS 303. F.S.

NURS 323. Adult Nursing Care II. 2 Credits.
This course focuses on the nursing care of adult patients with a variety of conditions, with a primary emphasis on acute health alterations. Lecture. Prerequisites: NURS 321, NURS 322, NURS 371, NURS 372 and PPT 315. Corequisites: NURS 325 and NURS 373. F.S,SS.

NURS 324. Public Health Nursing Theory. 2 Credits.
The course emphasizes population-based health and the role of the public health nurse. Lecture. Prerequisites: NURS 321, NURS 322, NURS 371 and NURS 372. Corequisite: NURS 374. Prerequisites or corequisites: NURS 323, NURS 325, NURS 326 and NURS 373. F.S,SS.

NURS 325. Advanced Nursing Procedures. 1 Credit.
Advanced nursing procedures are acquired and applied through simulated laboratory experiences. Laboratory. Prerequisites: NURS 321, NURS 322, NURS 371 and NURS 372. Corequisite: NURS 323 and NURS 373. F.S,SS.

NURS 326. Evidence-Based Practice. 2 Credits.
The course focuses on evidence-based practice in nursing with the emphasis on the philosophy, models, and application of evidence to practice. Students will apply research findings, clinical expertise, and patient preferences to a clinical problem. Prerequisites: NURS 321, NURS 322, NURS 371 and NURS 372; SOC 326 or PSYC 241 or ECON 210. Corequisite: NURS 323 and NURS 373. F.S.

NURS 330. Health & Illness II. 4 Credits.
This clinical course focuses on developing the generalist role in managing patient care as a member of the health care team. The student will competently apply evidence-based knowledge, skills, attitudes and patient care technologies that will promote a state of optimal health for their patients. Students will professionally interact with individuals across the lifespan and in diverse populations to provide safe, quality and patient-centered care. Prerequisites: NURS 300, NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. Corequisites: NURS 334, NURS 332, NURS 333, and NURS 331. F,S,SS.

NURS 331. Patient & Family-Centered Nursing. 3 Credits.
This course focuses on compassionate, patient-centered, evidence-based care that respects patient and family preferences across the lifespan to achieve optimal healthcare outcomes. Prerequisites: NURS 300, NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. Corequisites: NURS 330, NURS 332, NURS 333, and NURS 334. F.S,SS.
NURS 332, Pathophysiology II. 2 Credits.
This is the second course in a two part series focusing on concepts of altered health in the development of clinical manifestations of disease and illness across the lifespan. Pathophysiological concepts of high incidence, prevalence and severity will be emphasized. Prerequisites: NURS 300, NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. Corequisites: NURS 330, NURS 331, NURS 333, and NURS 334. F.S.SS.

NURS 333. Clinical Practicum II. 4 Credits.
This clinical course focuses on developing the generalist role in managing patient care as a member of the health care team. The student will competently apply evidence-based knowledge, skills, attitudes and patient care technologies that will promote a state of optimal health for their patients. Students will professionally interact with individuals across the lifespan and in diverse populations to provide safe, quality and patient-centered care. Prerequisites: NURS 300, NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. Corequisites: NURS 330, NURS 331, NURS 332, and NURS 334. F.S.SS.

NURS 334. Nursing Pharmacology II. 2 Credits.
This is the second in a two part series of courses that will advance student knowledge of pharmacokinetics, and pharmacodynamics by learning about different categories of drugs. Drug classifications provide the framework for understanding the action, use, adverse effects and nursing implications of drugs. Using a concept-based approach, examples of medications as they relate to human body systems across the lifespan will be discussed. This course will include classroom and laboratory experiences. Prerequisites: NURS 300, NURS 301, NURS 304, NURS 310, NURS 312, and NURS 313. Corequisites: NURS 330, NURS 331, NURS 332, and NURS 333. F.S.SS.

NURS 350. Nursing in Transition. 3 Credits.
This course covers two distinct essentials for nurses returning for their bachelor's or master's degree. The first portion of the course explores concepts preparing the registered nurse student for entry into baccalaureate nursing and continuing socialization in the profession. The second portion provides an orientation to resources essential for successful program completion. F.

NURS 363. Test Taking Strategies. 1 Credit.
Content includes: test taking strategies, completion of a personal Learning Plan, completion of practice questions related to the ATI test(s) the student needs to retake, non-proctored exams, and successful passing of the ATI test(s) the students needs to take. Repeatable to 4 credits. S/U grading. F.S.SS.

NURS 371. Adult Nursing Care I. 4 Credits.
This theory and clinical course focuses on the nursing care of adults in different settings with a variety of conditions with a primary emphasis on concerns of the elderly. Caring and professional behaviors are implemented as a member of the health care team to promote, maintain, and/or restore optimum health of individuals in selected clinical settings. Successful completion of the non-credit clinical experience is required. Lecture/Clinical. Prerequisites: NURS 284, 289, 302, 303, and Nursing majors only. Corequisite: NURS 321. Prerequisite or Corequisite: PPT 315. F.S.SS.

NURS 372. Childbearing Family. 2 Credits.
This course concentrates on the delivery of nursing care to the healthy childbearing family. Lecture/Clinical. Successful completion of the non-credit clinical component of the course is required. Prerequisites: NURS 282, NURS 284, NURS 289, NURS 302, NURS 303, and Nursing majors only. Corequisites: NURS 321 and NURS 322. F.S.

NURS 373. Adult Nursing Care II Clinical. 4 Credits.
Application of nursing care for adult patients with a variety of conditions, with a primary emphasis on acute health alterations. Caring, professional behaviors are implemented as a member of the health care team to promote, maintain and/or restore optimum health of individuals in acute clinical settings. Clinical. Prerequisites: NURS 321, NURS 322, NURS 371, NURS 372, PPT 315, and Nursing majors only. Corequisites: NURS 323 and NURS 325. F.S.SS.

NURS 374. Public Health Nursing Clinical. 2 Credits.
Students will apply the concepts of population-based practice through various public health nursing roles. Clinical. Prerequisites: NURS 321, NURS 322, NURS 371, NURS 372, and Nursing majors only. Corequisites: NURS 323, NURS 324, NURS 325, NURS 326, and NURS 373. F.S.SS.

NURS 393. Academic Nursing Internship. 1 Credit.
Academic Nursing Internship (ANI) integrates nursing knowledge, skills and actions while working as a member of an interdisciplinary healthcare team. This course is designed to utilize the student's prior course work to continue to develop clinical reasoning skills. Qualified nursing students are employed by selected healthcare agencies while enrolled in NURS 393 for academic credit. Hours are arranged by mutual agreement between student, ANI faculty coordinator, and employer. Prerequisites: Admitted to UND nursing program, good academic standing within Nursing and UND, successful completion of NURS 371 and NURS 321, completion of 24 academic nursing credits, and consent of agency and faculty coordinator. Repeatable to 4 credits. F.S.SS.

NURS 394. Independent Study. 1-4 Credits.
Supervised independent study of non-honors students in nursing. Prerequisite: Only open to juniors and seniors in the nursing program. Repeatable to 9 credits. On demand.

NURS 397. Cooperative Education: Nursing. 1-2 Credits.
An experiential learning experience in nursing integrating clinical work experience, nursing theory and evaluation. Designed to enhance the student's prior course work in nursing. Qualified nursing students are employed by selected healthcare agencies on either the parallel or summer plan. Hours are arranged by mutual agreement among student, coordinator, and employer. Clinical. Prerequisites: NURS 321, NURS 371, Nursing majors only, and minimum overall GPA of 2.50. Repeatable to 24 credits. S/U grading. F.S.SS.

NURS 400. Special Topics. 1-4 Credits.
Elective opportunities offered in the College of Nursing which may be a combination of special projects, seminars, and clinical experience. Repeatable to 12 credits.

NURS 403. Nursing Across the Lifespan Practicum. 2 Credits.
This course expands the nursing students' knowledge about the healthcare continuum and patients throughout the lifespan through simulated and/or clinical interaction in diverse settings and specialty areas. Students will learn to integrate conceptual knowledge of altered health states as a basis for providing comprehensive care. Clinical reasoning skills will be applied to achieve safe, quality outcomes for patients in diverse populations with complex health conditions. Prerequisites: NURS 330, NURS 331, NURS 332, NURS 333, and NURS 334. Corequisites: NURS 404, NURS 406, NURS 420, NURS 430, and NURS 433. F.S.

NURS 404. Professional Nurse II. 2 Credits.
This course provides a focus on the refinement of the professional nursing role within a complex and dynamic health care environment. This is accomplished with exploration of health promotion, caregiving, safety systems, technology and informatics, and health care quality within the baccalaureate generalist practice roles. Prerequisites: NURS 330, NURS 331, NURS 332, NURS 333, and NURS 334. Corequisites: NURS 403, NURS 406, NURS 420, NURS 430, and NURS 433. F.S.

NURS 405. Informatics in Nursing. 3 Credits.
This web-enhanced course introduces students to the role of nursing informatics in identifying, collecting, processing, and managing information uniquely relative to nursing and healthcare. Students learn how to assess, develop and use nursing information systems to work more efficiently and effectively, and to improve patient care. The learning environment emphasizes the development of proficiency in the use of the computer as a critical thinking and decision making tool. Prerequisites: Basic keyboard and internet utilization skills. S.

NURS 406. Evidence Informed Practice. 2 Credits.
Concepts of evidence-informed practice and nursing research are explored. Methods for critical appraisal of qualitative and quantitative research will be applied. Critical appraisal is performed to inform the delivery of safe and quality nursing care. Students will apply research findings, clinical expertise, and informatics, and health care quality within the baccalaureate generalist practice roles. Prerequisites: NURS 330, NURS 331, NURS 332, and NURS 334. Corequisites: NURS 404, NURS 420, NURS 430, and NURS 433. F.S.

NURS 410. Critical Reasoning for Safety and Quality Outcomes. 3 Credits.
This course emphasizes the development of higher level clinical reasoning skills with an outcome based focus on safety and quality. F.
NURS 415. Interprofessional Collaborations For Improving Health Care Systems Outcomes. 3 Credits.
Utilizing opportunities to collaborate with other health care professionals in their home communities and online, students will explore the theory and practice of improving health care systems while providing an opportunity for interprofessional educational experience. S.

NURS 420. Interprofessional Health Care. 1 Credit.
The focus of this course is learning to work effectively with an interprofessional health care team using a shared patient-centered approach. Case studies will be the primary teaching strategy. Proessions include: physical therapy, nursing, occupational therapy, medicine, social work, communication science disorders, clinical lab science, physician assistant, and dietetics. Seminar. Prerequisite: NURS 473, F,S.

NURS 421. Child Health Nursing Theory. 2 Credits.
Complex care and nursing management of the acute and chronically ill child within the context of the family and the community. Lecture/Discussion. Prerequisites: NURS 323, NURS 324, NURS 325, NURS 326, NURS 373 and NURS 374. F,S.

NURS 425. Practicum Theory. 2 Credits.
Emphasis is on concepts related to assuming a professional nurse role. Analysis and evaluation focuses on the transition process, nursing regulations, quality improvement, and other concepts contributing to professional performance. Lecture/Discussion. Prerequisites: NURS 471, NURS 472, NURS 473, and Nursing majors only. Corequisite: NURS 475, F,S.

NURS 430. Health & Illness III. 4 Credits.
This course is the third in a series using concept based curriculum exemplars to emphasize the nurse's role in managing the care of patients experiencing acute and chronic illness across the life span. Students will recognize complex altered health states and apply evidence-based interventions to promote a state of optimal health for their patients. Clinical reasoning skills will be broadened with a goal of achieving safe, quality outcomes for complex patient conditions. Prerequisites: NURS 330, NURS 331, NURS 332, NURS 333, and NURS 334. Corequisites: NURS 403, NURS 404, NURS 406, NURS 420, and NURS 433. F,S.

NURS 433. Clinical Practicum III. 4 Credits.
This clinical course broadens the student's development of clinical skills needed for safe, competent provision of care for diverse patients with multiple/complex problems across the life span. Students will work with other members of the inter-professional team to plan, implement and evaluate safe, quality care for patients based on concepts that complement the Health Illness III course. The course emphasizes proficiency and efficiency in applying evidence-based knowledge, skills, attitudes and patient care technologies that will promote a state of optimal health for patients. Prerequisites: NURS 330, NURS 331, NURS 332, NURS 333, and NURS 334. Corequisites: NURS 403, NURS 404, NURS 406, NURS 420, and NURS 433. F,S.

NURS 441. Population Based Health. 3 Credits.
The course emphasizes population-based health and the role of the public health nurse. Concepts and theories related to providing health care to complex systems and aggregates in community, state, nation and world are explored. Concepts of evidence-informed practice and nursing research are explored with the use of population health data. Emphasis is placed on prevention, promotion and protection of health, utilizing epidemiological data to identify health risks of populations. Social determinants of health, as a basis for population health, are emphasized. Prerequisites: NURS 403, NURS 404, NURS 406, NURS 420, NURS 430, and NURS 433. Corequisites: NURS 450, NURS 442, NURS 443, and NURS 453. F,S.

NURS 442. Health Care Infrastructure. 3 Credits.
This course focuses on the baccalaureate nurse role in the broader context of a health care system. An overview of health care organizations and health care system infrastructure is examined. The role of health care economics, health care law, quality improvement, and regulatory policy that shape the nature, quality and safety of the practice environment are examined. Prerequisites: NURS 403, NURS 404, NURS 406, NURS 420, NURS 430, and NURS 433. Corequisites: NURS 441, NURS 443, NURS 450, and NURS 453. F,S.

NURS 443. Clinical Practicum IV. 2 Credits.
Concepts and theories from Population-Based Health are applied to the health care of individuals, groups, communities and populations. There is a concentrated focus on health promotion and disease/injury prevention. An epidemiological approach is used to analyze health problems at local, state, and national levels. Students apply knowledge of primary, secondary, and tertiary levels of prevention using a population-based perspective. Roles of public health nurses are studied and implemented through a variety of clinical experiences with public and private agencies. Prerequisites: NURS 403, NURS 404, NURS 406, NURS 420, NURS 430, and NURS 433. Corequisites: NURS 441, NURS 442, NURS 450, and NURS 453. F,S.

NURS 444. Baccalaureate Nursing Review Course. 1 Credit.
In this course, the student will participate in a comprehensive review and synthesis of nursing knowledge developed throughout the curriculum, and the study skills, stress management techniques and test-taking strategies that will prepare them for the National Licensure Examination-Registered Nurse (NCLEX-RN). Prerequisites or Corequisites: NURS 442 and successful completion of semester 3 nursing courses. F,S.

NURS 450. Transition to Practice: Seminar. 2 Credits.
This seminar course prepares students to transition from student status to a professional nursing role. It allows the student to synthesize and integrate previous learning experiences. Emphasis is placed on the role of the nurse as a provider of indirect and direct care; designer, manager and coordinator of care; and member of the profession. This writing intensive course along with Clinical Practicum V, is a UND Essential Studies Capstone requirement with an emphasis on advanced communication. Prerequisites: NURS 403, NURS 404, NURS 406, NURS 420, NURS 430, and NURS 433. Corequisites: NURS 441, NURS 442, NURS 443, and NURS 453. F,S.

NURS 453. Clinical Practicum V: Transition to Practice. 3 Credits.
A preceptor model of learning provides clinical opportunities to synthesize and integrate previous learning experiences. Emphasis is placed on the role of the nurse as a provider of indirect and direct care; designer, manager and coordinator of care; and member of the profession. The focus is on individual transition to the professional nursing role, recognizing the organizational, social, political, economic, ethical and legal context in which interdisciplinary health care is delivered in a selected clinical setting. Prerequisites: NURS 403, NURS 404, NURS 406, NURS 420, NURS 430, NURS 433. Corequisites: NURS 441, NURS 442, NURS 443, NURS 450. F,S.

NURS 471. Child Health Nursing Clinical. 1 Credit.
Complex care and management of the vulnerable, high risk child and the ill child within the context of the family and the community. Lecture/Discussion/ Clinical. Prerequisites: NURS 323, NURS 324, NURS 325, NURS 326, NURS 373, NURS 374, and Nursing majors only. Prerequisite or Corequisite: NURS 421. F,S.

NURS 472. Psych/Mental Health Nursing Clinical. 4 Credits.
Emphasis is on interactive processes, and dynamics of human diversity and behavior in mental health promotion, maintenance, and restoration. Lecture/Discussion/Clinical. Prerequisites: NURS 323, NURS 324, NURS 325, NURS 326, NURS 373, NURS 374, and Nursing majors only. F,S.

NURS 473. Multisystem Complex Adult Health. 4 Credits.
Complex concepts are integrated into the management of nursing care of adults with multisystem health problems. Lecture/Clinical. Prerequisites: NURS 323, NURS 324, NURS 325, NURS 326, NURS 373, NURS 374, and Nursing majors only. F,S.

NURS 474. Professional Development II. 5 Credits.
Focus is on the development of the professional nursing role within a complex and dynamic health care environment, with exploration of issues critical to leadership in nursing. Lecture/Discussion/Clinical. Prerequisites: NURS 471, NURS 472, NURS 473, and Nursing majors only. F,S.

NURS 475. Practicum. 4 Credits.
This is an intensive clinical experience providing application of content from all previous courses. Emphasis is on the application of concepts related to professional nursing role development, transition process, and evaluation processes used in the delivery of health care. Clinical. Prerequisites: NURS 471, NURS 472, and NURS 473, and Nursing majors only. Corequisite: NURS 425. F,S.

NURS 476. Complex Childbearing Family. 2 Credits.
This course concentrates on the delivery of nursing care to complex, high risk childbearing families. Lecture/Clinical. Prerequisites: NURS 471, NURS 472, NURS 473, and Nursing majors only. F,S.
NURS 499. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Prerequisites: Nursing majors only; Consent of the department and approval of the Honors Committee. Repeatable to 9 credits. F.S.

NURS 490. Transcultural Health Care Theories, Research, and Practice. 3 Credits.
Analysis of theories, principles, and research related to transcultural health care. Students develop awareness of the biological, psychological, and sociological aspects of clients of selected cultural groups and identify their specific health care values and practices. Prerequisites: Nursing major and junior standing; or permission of instructor. F.S.

Nutrition and Dietetics (N&D)

http://nursing.und.edu/departments/nutrition-dietetics/

Alakaam, Bodensteiner, Bohn, Rubash, Shin, Swanson, Tande, Walker and Wang

The Department of Nutrition and Dietetics is a student-centered department with focus on empowering students to reach their full potential in a innovative learning environment. Through teamwork and our progressive curriculum, we prepare students for employment to improve people’s well being through the promotion of healthy food choices and optimal nutrition. The department offers two majors and a nutrition minor. The undergraduate programs lead graduates to entry-level competence with degrees in:

B.S. in Community Nutrition
B.S. in Dietetics

Academic Advising

Students are assigned an academic adviser at the time of admission to the University if the student has declared a Pre-Dietetics or Community Nutrition major. Majors within the department are advised to follow the appropriate curriculum leading to either a Bachelor of Science in Dietetics or a Bachelor of Science in Community Nutrition. Since the Department of Nutrition and Dietetics strives to reflect current trends in the profession, there may be changes in the curriculum after the printing of this catalog.

Service Learning

Students within the Department of Nutrition and Dietetics will enhance their own personal and academic development through the completion of service learning activities. The accomplishments gained through these experiences will be demonstrated to others through the development of a reflective portfolio.

Scholarships

Students may apply annually for awards and scholarships offered within the Department of Nutrition and Dietetics. Various professional organizations also offer competitive scholarships. Information regarding eligibility and application guidelines may be obtained at http://nursing.und.edu/departments/nutrition-dietetics/department-scholarships.cfm

Student Organizations

Student Association of Nutrition and Dietetics (SAND)

SAND is the student association for all majors and minors within the Department of Nutrition and Dietetics. Information regarding SAND may be obtained from its officers or from the faculty or staff in the department.

Community Nutrition

The Community Nutrition curriculum is designed to allow students to develop an in-depth understanding of nutrition, based on the biological and social sciences; the ability to communicate nutrition principles effectively and accurately to the public; and the ability to participate as a team member with other community and health care professionals. The focus of study is on the role of nutrition in achieving and maintaining health, emphasizing changing needs through the life cycle. Coursework and supervised practice experience prepares graduates to complete community nutrition assessments and to work individually or collaboratively with other professionals in identifying problems and developing, conducting and evaluating interventions to improve the overall health of individuals and communities. Students majoring in Community Nutrition select from two options: Nutrition and Foods or Nutrition and Society. A Community Nutrition graduate is eligible to become a Licensed Nutritionist (L.N.) in the state of North Dakota.

Graduation Requirements

To graduate, a Community Nutrition major must earn a grade of “C” or better in all nutrition, foods and science courses, attain an overall grade point average of at least 2.2, and successfully complete 180 hours of supervised practice.

Coordinated Program in Dietetics

The Coordinated Program in Dietetics combines academic preparation with supervised practice experiences for students who wish to become a Registered Dietitian Nutritionist (R.D.N)/Registered Dietitian (R.D). Students work in a variety of settings to improve or maintain nutritional health for patients and clients. The special focus of the UND Coordinated Program is dietetic practice in rural communities. Upon completion of this degree, the graduate is eligible to take the examination for professional registration and to apply for active membership in the Academy of Nutrition and Dietetics. Application for admission to the Coordinated Program occurs in spring semester for admission the following fall semester. A minimum grade point average (GPA) of 2.60 and a minimum of a “C” grade in all science, foods, and nutrition courses are required; however, the average GPA of accepted students is closer to 3.40. The Coordinated Program in Dietetics is fully accredited by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics (120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995; phone 312-899-0040, ext. 540), a specialized accrediting body recognized by the Council for Higher Education Accreditation and the United States Department of Education.

Admission to the professional phase of the Coordinated Program in Dietetics

To be considered a candidate for admission, the student must have already completed, be currently enrolled in, or plan completion through summer school enrollment of all pre-professional courses. Criteria for admission include a demonstrated interest in the field of dietetics, a minimum GPA of 2.6, and a grade of “C” or better in all nutrition, foods, and science courses and completion of at least 80 service learning hours prior to entering the program.

The application process consists of: submission of an application form; a personal statement incorporated into a letter of application; a portfolio highlighting goals, service learning, and examples of work; and two letters of reference. Eligible applicants are scheduled for personal interviews with selection committee members. At the conclusion of interviews, the committee and faculty meet to determine members of the incoming class. The Coordinated Program is accredited to accept up to 12 students each year; however, the program is not mandated to fill all slots each year. Only students who meet the specific qualifications and pass the application process will be considered.

Admission of transfer students to the Coordinated Program in Dietetics

Transfer students seeking admission to the professional phase of dietetics must fulfill the same prerequisite requirements as students who complete the pre-professional courses at the University of North Dakota. Students planning to transfer from another accredited institution to UND are advised to contact the Department of Nutrition and Dietetics to verify equivalency of courses on other campuses with those offered at UND prior to applying for admission. All qualified students, whether currently enrolled at or planning to transfer to UND, are given equal consideration.

Progression requirements

Students in the program must maintain satisfactory performance in all supervised practice experiences, a minimum GPA of 2.6, and at least a “C” in all nutrition, food and science courses to progress and graduate in the program. Failure to do so will result in being placed on probation. The program director
will meet in conjunction with the student and academic adviser to discuss the probationary status and develop plans to correct the deficiency.

Additional expenses

The professional phase of the program has additional expenses due to supervised practice experiences, travel, and professional activities. Additionally, the schedule of classes and supervised practice experiences must have precedence in planning other time commitments, thus limiting employment opportunities. Definite plans for financing the costs of the two years (junior academic year, summer session, senior academic year) of the professional phase should be arranged prior to application. An estimate of expenses is available from the Department of Nutrition and Dietetics. Financial aid and scholarships are available from various sources. The UND Financial Aid Office can assist in determining which resources are available to individual students.

B.S. in Dietetics (p.

College of Nursing and Professional Disciplines

B.S. in Community Nutrition

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Prerequisite Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>8</td>
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<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
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<td>and Survey of Organic Chemistry Laboratory</td>
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<tr>
<td>BMB 301</td>
<td>Biochemistry</td>
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</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>5</td>
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<td>&amp; 204L</td>
<td>and Anatomy for Paramedical Personnel Laboratory</td>
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<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
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<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<tr>
<td>MKRT 201</td>
<td>Personal Marketing</td>
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<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
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<td>or PSYC 241</td>
<td>Introduction to Statistics</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>COMM 212</td>
<td>Interpersonal Communication</td>
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<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
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<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
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<tr>
<td>or PSYC 250</td>
<td>Developmental Psychology</td>
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* CHEM 115 Introductory Chemistry, CHEM 115L Introductory Chemistry Laboratory and CHEM 116 Introduction to Organic and Biochemistry, CHEM 116L Introduction to Organic and Biochemistry Laboratory may be substituted for CHEM 121 General Chemistry I, CHEM 121L General Chemistry I Laboratory, CHEM 122 General Chemistry II, CHEM 122L General Chemistry II Laboratory, CHEM 340L Survey of Organic Chemistry, CHEM 340L Survey of Organic Chemistry Laboratory, and BMB 301 Biochemistry.

III. Required Courses:

<table>
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<th>Credits</th>
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<tr>
<td>N&amp;D 100</td>
<td>Introduction to Nutrition and Dietetics</td>
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<tr>
<td>N&amp;D 220</td>
<td>Foodservice Safety and Sanitation</td>
<td>1</td>
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<tr>
<td>N&amp;D 240</td>
<td>Fundamentals of Nutrition</td>
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<td>N&amp;D 245</td>
<td>Nutrition Through the Life Cycle</td>
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<td>N&amp;D 250</td>
<td>Consumer Food Issues</td>
<td>3</td>
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<tr>
<td>N&amp;D 335</td>
<td>World Food Patterns</td>
<td>3</td>
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<td>N&amp;D 345</td>
<td>Community Nutrition</td>
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<td>N&amp;D 348</td>
<td>Sports Nutrition</td>
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<td>N&amp;D 411</td>
<td>Advanced Nutrition</td>
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<tr>
<td>N&amp;D 494</td>
<td>Research in Nutrition and Dietetics</td>
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<tr>
<td>N&amp;D 497</td>
<td>Supervised Practice in Community Nutrition</td>
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IV. Choice of either Option A or Option B.

Option A:

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<th>Course Title</th>
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<tbody>
<tr>
<td>N&amp;D 260</td>
<td>Principles of Foods and Food Science</td>
<td>5</td>
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<tr>
<td>N&amp;D 340</td>
<td>Foodservice Systems Production</td>
<td>2</td>
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<tr>
<td>N&amp;D 440</td>
<td>Foodservice Systems Management</td>
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Option B:

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<tr>
<td>SOC 335</td>
<td>Families in a Changing Society</td>
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<tr>
<td>SOG 355</td>
<td>Drugs and Society</td>
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<tr>
<td>or PPT 315</td>
<td>Human Pharmacology</td>
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<tr>
<td>or PPT 410</td>
<td>Drugs Subject to Abuse</td>
<td></td>
</tr>
<tr>
<td>SOC 352</td>
<td>Aging and Society</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 355</td>
<td>Adulthood and Aging</td>
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* MGMT 300 Principles of Management may be substituted for N&D 340 Foodservice Systems Production and N&D 440 Foodservice Systems Management.

V. Electives or minor.

In consultation with adviser, the student will select a minor or electives to meet the University minimum of 125 semester hours of credit for graduation.

B.S. in Dietetics

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The following curriculum:

Pre-professional requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
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<tr>
<td>&amp; 204L</td>
<td>and Anatomy for Paramedical Personnel Laboratory</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
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</tr>
<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
<td></td>
</tr>
<tr>
<td>N&amp;D 100</td>
<td>Introduction to Nutrition and Dietetics</td>
<td>1</td>
</tr>
<tr>
<td>N&amp;D 220</td>
<td>Foodservice Safety and Sanitation</td>
<td>1</td>
</tr>
<tr>
<td>N&amp;D 240</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 245</td>
<td>Nutrition Through the Life Cycle</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 250</td>
<td>Consumer Food Issues</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 100</td>
<td>Introduction to Nutrition and Dietetics</td>
<td>1</td>
</tr>
<tr>
<td>N&amp;D 220</td>
<td>Foodservice Safety and Sanitation</td>
<td></td>
</tr>
<tr>
<td>N&amp;D 240</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 245</td>
<td>Nutrition Through the Life Cycle</td>
<td>3</td>
</tr>
</tbody>
</table>
Minor in Nutrition

Students in other majors may elect to earn a minor in nutrition. The requirements of the minor are the completion of 20 semester hours of credit in nutrition-related courses. To develop the program of study, students must consult an adviser in the Department of Nutrition and Dietetics.

N&D 100 Introduction to Nutrition and Dietetics 1
N&D 220 Foodservice Safety and Sanitation 1
N&D 240 Fundamentals of Nutrition 3
N&D 245 Nutrition Through the Life Cycle 3
N&D 250 Consumer Food Issues 3
N&D 260 Principles of Foods and Food Science 3
N&D 335 World Food Patterns 3
N&D 340 Foodservice Systems Production 2
N&D 345 Community Nutrition 3
N&D 350 Medical Nutrition Therapy I 2
N&D 440 Foodservice Systems Management 2
N&D 441 Advanced Nutrition 4
N&D 450 Medical Nutrition Therapy II 3
N&D 480 Interprofessional Health Care 1
N&D 494 Research in Nutrition and Dietetics 2
N&D 498 Supervised Practice in Dietetics 3

Electives to meet 12 credits

Total Credits 57

Courses

N&D 100. Introduction to Nutrition and Dietetics. 1 Credit.
The philosophy, history, future trends, and career options in nutrition and dietetics will be discussed. S/U grading. S.

N&D 220. Foodservice Safety and Sanitation. 1 Credit.
The study of food safety and sanitation throughout the foodservice system. Upon successful completion of the course material and examination, the student will hold ServSafe® Certification. S.

N&D 240. Fundamentals of Nutrition. 3 Credits.
Basic principles of nutrition with application for individuals and family groups. F,S,SS.

N&D 245. Nutrition Through the Life Cycle. 3 Credits.
Optimal growth and development throughout the lifespan requires proper nutrition. The course explores how nutrition needs vary across the lifespan from both a biological and psychosocial perspective. The impact of nutrition from preconception through old age is the focus of this course. Every phase of life is examined with consideration for normal growth and development, nutrient needs, and common nutritional issues. Prerequisite: N&D 240. F.

N&D 250. Consumer Food Issues. 3 Credits.
Students will explore all aspects of meal management with consideration of the importance of palatability and presentation of food as a means to improve nutritional status. Emphasis will be placed on preparing students with practical skills and knowledge needed to effectively assist consumers, clients and groups with informed food choices. Topics considered by the course include: food composition, purchasing, palatability and quality, meeting nutritional needs through menu planning, budgeting and organizational skills. The impact of various regulatory agencies on protection and distribution of the food supply will be examined. Content will be presented through classroom lectures and activities with opportunity to apply and develop skills in lab sessions. The course will meet for 2 hours of lecture and 2 hours of lab per week. Prerequisites: N&D 240 and one semester of chemistry. F.

N&D 260. Principles of Foods and Food Science. 3 Credits.
Introduction to food selection and preparation principles, sensory evaluation of food, role of ingredients, and food technology. Emphasizes application of scientific principles in relationship to food composition, physical properties, and chemical reactions during food preparation. Prerequisite: A college level chemistry course. S.

N&D 335. World Food Patterns. 3 Credits.
Examination of the food patterns of selected world population groups considering the effect of social, cultural, and economic practices on nutritional values. F.

N&D 340. Foodservice Systems Production. 2 Credits.
Principles of food production as applied to preparation, service, and evaluation of foods; use and operation of food service equipment. Prerequisite: N&D 240. F.

N&D 345. Community Nutrition. 3 Credits.
This course is the 3-credit course to study nutrition in a community. It provides an opportunity for students to develop a variety of communication skills sufficient for entry into pre-professional practice. The course is designed to allow you, the student to develop the knowledge and skills necessary to plan programs and promote nutritional well-being to the public. Through readings, lectures and class discussions you will work in a group to select a community to assess, research it relative to interrelated health, social and economic concerns, and identify nutrition priorities that need to be addressed in that community. You will hone speaking and writing skills learned in previous courses through a graduated series of assignments, and you will learn how to critique the work of others, to give helpful feedback, and to work effectively to complete group and individual assignments. Prerequisite: N&D 245, S.

N&D 348. Sports Nutrition. 3 Credits.
Sports Nutrition is an overview of the specialized nutritional needs of recreational and competitive athletes. It presents the scientific basis for the role of food and nutrients during athletic training, performance, and recovery. Prerequisite: N&D 240, F,SS.

N&D 350. Medical Nutrition Therapy I. 2 Credits.
The study and application of nutritional assessment techniques, nutrition care planning methodologies, interviewing and counseling skills, and medical nutrition therapy for common medical conditions. Prerequisite: N&D 245 and PPT 301. F.

N&D 440. Foodservice Systems Management. 2 Credits.
Apply principles of management to quantity and quality food production and analysis. Prerequisite: N&D 340. SS.

N&D 441. Advanced Nutrition. 4 Credits.
A comprehensive investigation of the nutritional needs of humans with emphasis on nutritional biochemistry and current issues. Prerequisites: A grade of C or better in N&D 240, CHEM 116 or CHEM 340, and PPT 301. S,SS.

N&D 450. Medical Nutrition Therapy II. 3 Credits.
The study and application of nutritional intervention principles and medical nutrition therapy for complex medical conditions. Prerequisites: N&D 350 and N&D 441. F.
N&D 480. Interprofessional Health Care. 1 Credit.
The focus of this course is learning to work effectively with an interprofessional health care team using a shared patient-centered approach. Case studies will be the primary teaching strategy used. Prerequisite: Senior standing in Dietetics. S/U grading. S.

N&D 494. Research in Nutrition and Dietetics. 1-4 Credits.
Study and application of research designs and procedures appropriate to nutrition and dietetics. Repeatable to 6 credits. Prerequisites: Senior status with completion of a statistics course and a minimum of 12 credits in nutrition and dietetics. Repeatable to 6 credits. F.S.

N&D 497. Supervised Practice in Community Nutrition. 1-4 Credits.
Development of professional skills and competencies through planned learning experiences in which knowledge and theory are applied to simulated and real-life situations in community nutrition. Prerequisite: N&D 345, enrollment in the Community Nutrition program, and department consent required. Repeatable to 4 credits. F.S.S.

N&D 498. Supervised Practice in Dietetics. 1-12 Credits.
Development of professional skills and competencies through planned learning experiences in which knowledge and theory are applied to simulated and real-life situations in nutrition and dietetics. Prerequisite: Enrollment in the Coordinated Program in Dietetics; Dietetics majors require consent of instructor one semester prior to enrollment. Repeatable to 31 credits. F.S.S.S.

N&D 499. Special Topics in Nutrition and Dietetics. 1-4 Credits.
Special topics and/or in-depth independent study in selected content areas relative to nutrition and dietetics. Prerequisite: Instructor consent. Repeatable to 6 credits. On demand.

Occupational Therapy (OT)
See School of Graduate Studies (p. 559) section

Peace Studies (PS)
http://www.und.edu/arts-sciences

The Peace Studies courses listed below may be taken either as elective courses or as part of a course of study leading to the degree B.A. with a major in Interdisciplinary Studies: Peace Studies administered through the Interdisciplinary Studies Program (IDS). For information on the major in Interdisciplinary Studies, see Interdisciplinary Studies (p. 153).

The Peace Studies courses are taught by faculty members from the departments of Geography, Philosophy and Religion, History, Education, Economics, English, Psychology, Sociology, Languages, and the natural and physical sciences. Their goal is to encourage critical scholarly thinking and action by students and faculty in the growing areas of interest in issues of peace, war, social justice and human rights. They are excellent preparation for graduate study in a range of legal, governmental, social service, educational, theological and international fields. The major requires a total of 36 credits, including the listed courses, except for the Independent Study, and either HUM 408 OR IDS 495 (both are not required). If one or more courses are not offered within the timeframe that students have for their graduation, they may take alternative courses with the permission of the Program Director who serves as the academic advisor to Peace Studies students. Other courses may be selected by the student in consultation with the advisor to focus on an area of interest, for example, courses from the Chinese Studies minor, or other international or environmental topics.

GEOG 161. World Regional Geography. 3 Credits.
Development of the concept of region with analysis of the relationship of physical and cultural features to the contemporary world situation. F.S.

GEOG 250. Introduction to Geopolitics. 3 Credits.
As a branch of political geography, the study of Geopolitics is concerned with the spatial dynamics of power relations especially at the international level. From a geographic perspective, this course surveys changing relations among states and the influences of national and transnational actors and events. The course attempts to help students apply a broad range of theoretical perspectives to the analysis of global and regional issues and events, and develop insights into what is happening in the world today. From war and terrorism to economic globalization, human rights and sustainable development, this course will explore a myriad of important issues and challenges that face the world today. S.

PHIL 120. Introduction to Ethics. 3 Credits.
This course investigates the nature of the Good Life, of moral principles, and the application of moral systems to contemporary debate. These may include questions about the morality of war, capital punishment, sexual behavior, welfare, and so forth. F.S.

HIST 335. Nuclear Weapons and the Modern Age. 3 Credits.
An introduction to the history of: nuclear weapons and their delivery systems, their development and use during World War II, the nuclear arms race between the U.S. and the U.S.S.R., popular disarmament movements, and diplomatic efforts to control nuclear weapons and their proliferation. A final section will deal with the nuclear implications of the end of the Cold War and the development of new nuclear states in the last years of the 20th century. The course will include--from an historian's point of view--some technical material necessary to a reasonable and realistic understanding of the subject. S, even years.

HUM 283. Evidenced Based Reasoning Across Disciplines. 3 Credits.
In this course, students will examine chosen issues in the sciences, social sciences, and humanities and will gain a general familiarity with the academic and popular forms of writing, evidence based reasoning, and research in each discipline. They will become familiar with the research methodologies of each discipline and learn to integrate the different methods and perspectives with their own analysis. F.S.

PS 394. Independent Study. 1-4 Credits.
Supervised reading, study or research on an individual topic. Prerequisite: Consent of instructor. Repeatable to 6 credits. On demand.

IDS 491. Capstone Interdisciplinary Seminar. 1-3 Credits.
This seminar will be organized by the director of the Interdisciplinary Studies Program to act as a point of reference for students working on their Senior Projects in the program. The projects will vary from semester to semester, so the focus will shift accordingly. Not repeatable. Prerequisite: IDS 280. Corequisite: IDS 498. S.

PS 497. Internship. 3-16 Credits.
Provides direct experience in a peace-related, social change, human service/ human rights or international agency. Prerequisites: Junior standing and advisory approval. Repeatable to 16 credits. S/U grading. F.S.

HUM 408. Writing Across the Disciplines. 3 Credits.
This senior level course will provide students with an intensive writing experience that focuses on methods and strategies in the humanities, social sciences, and sciences. Students will gain an understanding of the theoretical underpinnings of the disciplines while they engage in the process of integrating disciplinary materials and writing to form a well-reasoned argument. Students will master expository writing, research skills, and popular forms of writing, evidence based reasoning, and research in each discipline. They will become familiar with the research methodologies of each discipline and learn to integrate the different methods and perspectives with their own analysis. F.S.

IDS 495. Service and Citizenship. 3 Credits.
Students will design community service projects, or will join existing projects, and engage in volunteer action during the semester. Class meetings on campus will center on a critical discussion of volunteerism and community service; current literature on service learning will be studied. Self-assessment of experiential learning outcomes, as well as a portfolio and essay will be required. Prerequisite: Junior or Senior standing. F.S.S.S.

Petroleum Engineering (PtrE)
http://engineering.und.edu/petroleum/
Rasouli (Chair), Bubach, Jabbabi, Ling, Ostadhassan, Pu and Rabiei

The goal of the Petroleum Engineering department is to educate undergraduate students so they will be prepared to compete for challenging entry-level positions in the petroleum industry and government agencies. Entry level petroleum engineers are involved in a diverse range of jobs that include: exploration for oil and gas-containing formations and reservoirs; characterization of reservoirs and fluids; design of equipment and processes to optimize recovery; drilling and completions; computer modeling and simulation for production optimization and field management, recovery development; and monitoring of production and processing. In addition to these upstream activities, petroleum engineers are also involved in downstream activities such as refining, petro-chemical production, and transportation of products as well as geosciences, environmental efforts, and international commerce. Petroleum engineers are trained to ensure that all operations are safe and environmentally healthy.
Currently UND offers the only Petroleum Engineering program in the state of N.D. With the discovery and development of the unconventional resources, in particular with the Bakken Formation in Williston Basin being the second largest producer of oil in the US, this program is strategically important to UND in terms of educating practical and hands-on engineers who can work in the field, and also develop the latest technologies for discovery, exploration, drilling and production of the oil and gas fields to produce future energy. Our Graduate program is focused to perform both fundamental and practical research on topics in demand of the industry.

The UND petroleum engineering program emphasizes the development of technical problem solving skills through a fundamental understanding of geology, chemistry, physics, and engineering. The fundamentals and problem solving skills are combined with a strong background in ethics, safety, economics, information technology, leadership, management, and communication. The Petroleum Engineering degree is designed to provide students with a systematic understanding of the petroleum industry that includes: science and technology; economics and business; policy and regulation; and society and behavior. Students will develop the skills to contribute to petroleum exploration, production/injection, property management and project optimization, and will demonstrate integrity, responsibility, ownership, and accountability for their work.

To meet the goals of the program, the following program educational objectives have been established.

The undergraduate Program Educational Objectives (PEO) are the expected accomplishments of graduates during their first few years following graduation. The PEOs of the Department of Petroleum Engineering (PTRE) as adopted by the PTRE faculty and Industry Advisory Board are as follows:

1. Contribute as engineering professionals in industry, including government or academia;
2. Pursue continued education and professional development through participation in professional organizations, training and possible post graduate education;
3. Progression or attainment of professional registration and licensure.

The core of the program is a strong technical curriculum, whereby the fundamentals of geology, physical sciences, mathematics, and petroleum engineering are learned. This core is complemented by general courses in other engineering and technical disciplines to help prepare the students for professional registration or other future careers. Twelve credits of the required technical courses are electives, which provide each student the opportunity to tailor the program to his/her individual interests such as petroleum geology, fuel technology, refining, entrepreneurship, etc. Other prescribed courses include topics such as economics, statistics and professional integrity. The program also gives students a chance to become proficient in computer skills, database management, oral and written communication, and team work. The undergraduate program culminates in a senior design course in which the students bring together all they have learned as they work in teams on a design and evaluation project.

Practical, hands-on experience is gained in laboratories distributed throughout the undergraduate program. Laboratory experiments form a significant part of each student’s learning beginning immediately in first year chemistry and continuing throughout the curriculum. In addition to university experiences, which include opportunities to conduct research, students are encouraged to spend time working in the engineering profession via summer internships or cooperative education.

Besides the technical education embodied in the program, there is a strong required general education component with a focus on thinking and reasoning in a diverse society. This is included to round out the individual’s university experience and help prepare for a full life, not just a career. There are also many extracurricular activities available (including professional societies, honor societies, sports and clubs) to enhance the enjoyment of the time spent at UND and to develop important friendships and leadership and team building skills.

One of the main characteristics of this department, which distinguishes it from most other petroleum engineering programs around the country, is the commitment to building a strong rapport between the students and faculty. We are able to maintain close interaction because of the relatively small class sizes, and because all faculty members are committed to helping all students do their best and succeed. The interaction between faculty and students occurs formally in the classrooms and through the advising process, but it also frequently arises informally because all faculty maintain an open door policy. It all adds up to an environment that fosters mutual respect and maximizes learning.

### College of Engineering and Mines

#### B.S. in Petroleum Engineering

Required 129 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

All students must meet each semester with their academic advisor.

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOE 210</td>
<td>Earth Dynamics &amp; Geophysics</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I (Essential Studies)</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I &amp; 121L and General Chemistry I Laboratory (ES=Q)</td>
</tr>
<tr>
<td>Arts &amp; Humanities Elective (ES=G or U)</td>
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<td><strong>Credits</strong></td>
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<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PTRE 201</td>
<td>Introduction to Petroleum Engineering</td>
</tr>
<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II &amp; 122L and General Chemistry II Laboratory</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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#### Sophomore Year

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<tr>
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<tbody>
<tr>
<td>ENGR 201</td>
<td>Statics</td>
</tr>
<tr>
<td>PTRE 301</td>
<td>Reservoir Rock Properties</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>University Physics II</td>
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<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
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<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PTRE 311</td>
<td>Petroleum Fluid Properties</td>
</tr>
<tr>
<td>PTRE 361</td>
<td>Petroleum Engineering Laboratory I</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
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<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
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<tr>
<td>ENGR 203</td>
<td>Mechanics of Materials</td>
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<td>GEOL 407</td>
<td>Petroleum Geology</td>
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<td><strong>Credits</strong></td>
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#### Junior Year

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<tr>
<td>PTRE 401</td>
<td>Well Logging</td>
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<tr>
<td>PTRE 431</td>
<td>Reservoir Engineering</td>
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<tr>
<td>PTRE 411</td>
<td>Drilling Engineering</td>
</tr>
<tr>
<td>GEOL 520</td>
<td>Statistical Applications in Geology or MATH 321 or CHE 315</td>
</tr>
<tr>
<td>or GEOL 520</td>
<td>Applied Statistical Methods or Engineering Statistics and Design of Experiments</td>
</tr>
<tr>
<td>Arts &amp; Humanities Elective (ES=G or U)</td>
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<td><strong>Credits</strong></td>
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<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PTRE 451</td>
<td>Advanced Drilling Engineering</td>
</tr>
<tr>
<td>PTRE 445</td>
<td>Advanced Reservoir Engineering</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>3</td>
</tr>
</tbody>
</table>
Admission Requirements

1. Interest in learning about Petroleum Engineering Topics.
2. Adequate experience in the field of petroleum engineering.

Certificate Requirements

1. A total of sixteen (16) credit hours must be completed from the following courses in the PE undergraduate curriculum:


2. Courses must be passed with the following requirements below:

Courses shall only count as credit toward fulfilling the requirements listed above when a grade of C or higher has been awarded at the completion of the course.

Certificate in Petroleum Engineering Admission Requirements

1. Bachelor of Science degree in an ABET accredited engineering program.
2. Adequate experience in the field of petroleum engineering.
3. An overall undergraduate GPA of at least 2.50 or 3.00 for the last two years.

Certificate Requirements

1. A total of sixteen (16) credit hours must be completed from the following courses in the PE undergraduate curriculum:


2. A minimum GPA of 3.00 is required to earn the certificate.

Courses

PTRE 201. Introduction to Petroleum Engineering. 3 Credits.
Introducing students to the broad aspects of petroleum engineering. The student will gain an appreciation for exploration, discovery, and commercial recovery of oil and gas industry. Prerequisite: Petroleum Engineering major. Prerequisites or Corequisites: GEOL 101 or GEOE 210; all the prerequisites must be completed with a "C" or higher. S.

PTRE 201B. Introduction to Petroleum Engineering. 3 Credits.
Introducing students to the broad aspects of petroleum engineering. The student will gain an appreciation for exploration, discovery, and commercial recovery of oil and gas industry. S/U grading. S.

PTRE 301. Reservoir Rock Properties. 3 Credits.
Systematic theoretical and practical study of physical properties of petroleum reservoir rocks; lithology, porosity, relative and effective permeability, fluid saturations, capillary characteristics, compressibility, rock stress, and fluid-rock interaction. Prerequisites: PTRE 201, CHEM 121, MATH 165; all the prerequisites must be completed with a "C" or higher. F.

PTRE 301B. Reservoir Rock Properties. 3 Credits.
Systematic theoretical and practical study of physical properties of petroleum reservoir rocks; lithology, porosity, relative and effective permeability, fluid saturations, capillary characteristics, compressibility, rock stress, and fluid-rock interaction. S/U grading. F.

PTRE 311. Petroleum Fluid Properties. 3 Credits.
Phase behavior of naturally occurring hydrocarbon system; evaluation and correlation of physical properties of petroleum reservoir fluids under various conditions of pressure and temperature, including laboratory and empirical methods. Prerequisites: CHEM 121 and PTRE 301; all the prerequisites must be completed with a "C" or higher. Corequisite: ME 341. S.

PTRE 311B. Petroleum Fluid Properties. 3 Credits.
Phase behavior of naturally occurring hydrocarbon system; evaluation and correlation of physical properties of petroleum reservoir fluids under various conditions of pressure and temperature, including laboratory and empirical methods. S/U grading. S.

PTRE 361. Petroleum Engineering Laboratory I. 1 Credit.
To introduce the students to different lab equipment in order to measure physical properties of the reservoir rock. Prerequisite: PTRE 301; all the prerequisites must be completed with a "C" or higher. Corequisite: On-campus students must take PTRE 311. S.

PTRE 401. Well Logging. 3 Credits.
This course covers topics on methods of how to measure and interpret the physical and chemical properties of formation through the well logging tools. Prerequisites: PTRE 301 and GEOL 407; all the prerequisites must be completed with a "C" or higher. F.

PTRE 401B. Well Logging. 3 Credits.
This course covers topics on methods of how to measure and interpret the physical and chemical properties of formation through the well logging tools. S/U grading. F.

PTRE 405. Petroleum Eng. Economy and Law. 3 Credits.
Presenting the principals of asset management with emphasis on applications to the upstream oil and gas activities and discussing the legal aspects of petroleum exploration and production in the US and internationally. Prerequisites: PTRE 445 and PTRE 451. Corequisite: PTRE 421. F.
PTRE 405B. Petroleum Eng. Economy and Law. 3 Credits.
Presenting the principals of asset management with emphasis on applications to the upstream oil and gas activities and discussing the legal aspects of petroleum exploration and production in the US and internationally. S/U grading. F.

PTRE 411. Drilling Engineering. 3 Credits.
Concepts, processes, equipment, and engineering principals used to drill oil and gas wells and near-surface wells common in geotechnical, environmental, and water well applications. Prerequisites: ENGR 203, PTRE 311 and ME 306; all the prerequisites must be completed with a "C" or higher. F.

PTRE 411B. Drilling Engineering. 3 Credits.
Concepts, processes, equipment, and engineering principals used to drill oil and gas wells and near-surface wells common in geotechnical, environmental, and water well applications. S/U grading. F.

PTRE 421. Production Engineering. 3 Credits.
Design, evaluation, and optimization of petroleum production system using nodal analysis. Analysis and design of well flow systems, artificial lift systems, and surface separation/treating facilities. S/U grading. F.

PTRE 431. Reservoir Engineering. 3 Credits.
Discussing general concepts in reservoir engineering, material balance equation for oil, gas, and water, determining reserves under different drive mechanisms, and fluid flow in different oil and gas reservoirs. Prerequisites: PTRE 311 and ME 306; all the prerequisites must be completed with a "C" or higher. F.

PTRE 431B. Reservoir Engineering. 3 Credits.
Discussing general concepts in reservoir engineering, material balance equation for oil, gas, and water, determining reserves under different drive mechanisms, and fluid flow in different oil and gas reservoirs. S/U grading. F.

PTRE 441. Petroleum Evaluation & Management. 3 Credits.
Expected value and investment decision analysis, estimation of oil and gas reserves, measures of profitability, production, decline curve analysis, and oil and gas reserves evaluations. Prerequisites: PTRE 311, PTRE 431, PTRE 411, and PTRE 421; all the prerequisites must be completed with a "C" or higher. S.

PTRE 441B. Petroleum Evaluation & Management. 3 Credits.
Expected value and investment decision analysis, estimation of oil and gas reserves, measures of profitability, production, decline curve analysis, and oil and gas reserves evaluations. S/U grading. On demand.

PTRE 445. Advanced Reservoir Engineering. 3 Credits.
Well test analysis using type curve techniques, Material balance for oil and gas reservoirs, Water influx calculations, Immiscible displacement and fractional flow calculations, Well test analysis to estimate reservoir properties, Pseudo functions, Enhanced oil recovery. Prerequisite: PTRE 431 with a grade of C or higher. S.

PTRE 445B. Advanced Reservoir Engineering. 3 Credits.
Well test analysis using type curve techniques, Material balance for oil and gas reservoirs, Water influx calculations, Immiscible displacement and fractional flow calculations, Well test analysis to estimate reservoir properties, Pseudo functions, Enhanced oil recovery. S/U grading. S.

PTRE 451. Advanced Drilling Engineering. 3 Credits.
Advanced topics in drilling which are part of well construction will be covered in this course. The sequence of constructing a well will be discussed and practiced through class projects and assignments. Prerequisite: PTRE 411; all the prerequisites must be completed with a "C" or higher. S.

PTRE 451B. Advanced Drilling Engineering. 3 Credits.
Advanced topics in drilling which are part of well construction will be covered in this course. The sequence of constructing a well will be discussed and practiced through class projects and assignments. S/U grading. S.

PTRE 461. Natural Gas Engineering. 3 Credits.
Estimation of gas properties; gas field development and material balance analysis; study of production and reservoir characteristics of gas and gas-condensate reservoirs; design and optimization of well bore and surface facilities for separation, processing, transportation, and metering; gas hydrates. Prerequisites: PTRE 301, ME 306, ME 341, and PTRE 311. S.

PTRE 461B. Natural Gas Engineering. 3 Credits.
Estimation of gas properties; gas field development and material balance analysis; study of production and reservoir characteristics of gas and gas-condensate reservoirs; design and optimization of well bore and surface facilities for separation, processing, transportation, and metering; gas hydrates. S/U grading. S.

PTRE 462. Petroleum Engineering Laboratory II. 1 Credit.
To introduce the students to different lab equipment in order to measure geomechanical properties of the rock and flow behavior of the reservoir fluid. Prerequisites: PTRE 411, PTRE 421, and PTRE 465; all the prerequisites must be completed with a "C" or higher. S.

PTRE 465. Petroleum Geomechanics. 3 Credits.
A brief review of fundamental of rock mechanics. The major focus of the course will be on different applications of Geomechanics in Petroleum Eng with focus on wellbore instability. Prerequisites: PTRE 451 and PTRE 431; all the prerequisites must be completed with a "C" or higher. F.

PTRE 465B. Petroleum Geomechanics. 3 Credits.
A brief review of fundamental of rock mechanics. The major focus of the course will be on different applications of Geomechanics in Petroleum Eng with focus on wellbore instability. S/U grading. F.

PTRE 471. Numerical Reservoir Simulation. 3 Credits.
Use of mathematics and computer programs to solve reservoir flow problems. This course will discuss: Fundamental reservoir calculations, multiphase flow concepts, fluid displacement, fluid flow equations and discretizetion concepts, as well as history matching and reservoir performance forecast. Prerequisites: PTRE 445 and MATH 266; all the pre-requisites must be completed with a C or higher. F.

PTRE 471B. Numerical Reservoir Simulation. 3 Credits.
Use of mathematics and computer programs to solve reservoir flow problems. This course will discuss: Fundamental reservoir calculations, multiphase flow concepts, fluid displacement, fluid flow equations and discretization concepts, as well as history matching and reservoir performance forecast. S/U grading. F.

PTRE 475. Stimulation and Intervention Techniques. 3 Credits.
Introduction to well problems including causes and remediation; near wellbore formation damage mechanism, control and prevention; sand and water production mechanisms; control and management; scale deposition removal and prevention; corrosion control and prevention; principles and practices of well worker and intervention operations; an overview of production logging tools and their various applications including production log interpretation, familiarization with new technology and reservoir stimulation by fracturing with emphasis on design and estimation; stimulation to improve productivity. Prerequisites: PTRE 421 and PTRE 451 with a grade of "C" or higher. S.

PTRE 475B. Stimulation and Intervention Techniques. 3 Credits.
Introduction to well problems including causes and remediation; near wellbore formation damage mechanism, control and prevention; sand and water production mechanisms; control and management; scale deposition removal and prevention; corrosion control and prevention; principles and practices of well worker and intervention operations; an overview of production logging tools and their various applications including production log interpretation, familiarization with new technology and reservoir stimulation by fracturing with emphasis on design and estimation; stimulation to improve productivity. S/U grading. S.

PTRE 484. Research Design. 3 Credits.
This is a research design course in the Petroleum Engineering program. It includes: Defining the design problem, establishing design objectives as well as design proposal, evaluating alternatives, specifying constraints, determining a methodology, and giving oral presentations on the research findings. Prerequisites: PTRE 401, PTRE 451, and PTRE 445; all prerequisites must be completed with a "C" or higher. F.

PTRE 485. Senior Design. 3 Credits.
This is a capstone design course in the Petroleum Engineering program. It includes: Defining the design problem, establishing design objectives, evaluating alternatives, specifying constraints, determining a methodology, and completing a formal design problem statements. Prerequisites: PTRE 484, PTRE 405 or ENGR 460, PTRE 485, and PTRE 471; all prerequisites must be completed with a "C" or higher. F.

PTRE 493. Selected Topics in Petroleum Engineering. 1-4 Credits.
Detailed study of selected topics in Petroleum Engineering. Includes laboratory if applicable. Repeatable up to a maximum of 6 credits. Prerequisite: Consent of the instructor. Repeatable to 6 credits. On demand.
Pharmacology, Physiology and Therapeutics (PPT)

http://www.med.und.edu/basic-sciences/

The Department of Basic Sciences offers undergraduate courses in pharmacology and physiology that serve majors and programs across colleges at UND.

Undergraduate Courses

PPT 301. Human Physiology. 4 Credits.
A study of the normal function of the human body with particular consideration given to the necessary background needed by students pursuing a course of study in Allied Health Sciences. There are five hours of formal classroom study including two hours of laboratory and an optional review period each week. Prerequisites: ANAT 204 and either BIOL 150/150L or CHEM 116/116L or CHEM 121/121L; open to Athletic Training, CLS, Community Nutrition, Cytotechnology, Dietetics, Pre-Dietetics, Nursing, Pre-Nursing, Pre-OT, PT, and OT majors only. F.S.

PPT 315. Human Pharmacology. 3 Credits.
A survey of the more important drugs used in medicine, including basic principles, clinical uses and possible adverse effects. Prerequisites: PPT 301 and CHEM 116 and CHEM 116L, or CHEM 121 and CHEM 121L, or CHEM 122 and CHEM 122L. S.

PPT 410. Drugs Subject to Abuse. 2 Credits.
Biochemical, pharmacological, behavioral and therapeutic aspects of substance abuse. Prerequisite: Advanced undergraduate standing. S.

PPT 499. Readings in Pharmacology, Physiology and Therapeutics. 1-4 Credits.
Topics and credits to be arranged with the instructor. Prerequisite: Consent of instructor. Repeatable to 4 credits. F.S.S.S.

Philosophy and Religion (Phil and Rels)

http://www.arts-sciences.und.edu/philosophy-religion

Beltz, Lawrence, Miller, Poochigian, Rozelle-Stone, Rundquist (Chair), Stone, and Weinstein

The two disciplines of Philosophy and Religion represent humankind’s abiding interest in the fundamental questions of life, truth, and value. Questions about the meaning of life, the significance of truth, the access to knowledge, and the ability to live ethically have been studied by philosophers and theologians from the time of Socrates and before. But both disciplines can be quite practical, preparing students for a career in law, politics, the ministry, or any profession that puts them in contact with people of different religions or cultures.

Philosophy seeks answers which, chiefly, refer to human capacities and ideals and to the world of experience in which we live; Religion will often include postulates about divine forces and spiritual realities in the answers it frames. The two disciplines tend to be more distinct in Western culture; philosophers and theologians have often been in bitter conflict both with each other and with religious authorities. In Eastern cultures, however, philosophy and religion overlap — often appearing as complements. In both East and West these two fields of study represent the longest and most basic traditions of literature and the intellectual life. Though Philosophy and Religion both address questions of ultimate meaning, each discipline preserves its own literary history and its own scholarly tradition.

Every student can benefit from coursework in Philosophy and Religion. Most courses in the department fulfill Essential Studies Requirements in Arts and Humanities. Several major programs require or recommend specific courses to their students. A two to five course series of courses in Philosophy and Religion can be designed to complement major programs in nursing, engineering, science, business, criminal justice studies, as well as humanities disciplines. Minor programs (21 hours) in Philosophy, Religion and Ethics can also give depth and breadth to any major program. Neither Philosophy nor Religion requires a large technical vocabulary even in upper level courses.

Those students who wish to pursue a major or a second major in Philosophy and Religion must follow one of the three programs of concentration:

1. B.A. in Philosophy and Religion: Philosophy Concentration
2. B.A. in Philosophy and Religion: Pre-Law Concentration
3. B.A. in Philosophy and Religion: Religion Concentration

B.A. with Major in Philosophy and Religion: Religion Concentration

College of Arts and Sciences

B.A. with a Major in Philosophy and Religion: Philosophy Concentration

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Philosophy Concentration requirements.

36 major hours, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 101</td>
<td>Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 110</td>
<td>Introduction to Logic</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following (Applied Philosophy):</td>
<td>3</td>
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<tr>
<td>PHIL 120</td>
<td>Introduction to Ethics</td>
<td></td>
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<tr>
<td>PHIL 130</td>
<td>Introduction to Political Philosophy</td>
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<tr>
<td>PHIL 221</td>
<td>Symbolic Logic</td>
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<tr>
<td>PHIL 250</td>
<td>Ethics in Engineering and Science</td>
<td></td>
</tr>
<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care</td>
<td></td>
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<tr>
<td>PHIL 252</td>
<td>Ethics in Business and Public Administration</td>
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<tr>
<td>PHIL 253</td>
<td>Environmental Ethics</td>
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<tr>
<td>Select two of the following (History of Philosophy):</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PHIL 300</td>
<td>Ancient Philosophy</td>
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<tr>
<td>PHIL 301</td>
<td>Medieval Philosophy</td>
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<tr>
<td>PHIL 302</td>
<td>Renaissance and Enlightenment</td>
<td></td>
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<tr>
<td>PHIL 303</td>
<td>Kant and the Nineteenth Century</td>
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<tr>
<td>Select two of the following (Major Topics in Philosophy):</td>
<td>6</td>
<td></td>
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<tr>
<td>PHIL 312</td>
<td>American Philosophy</td>
<td></td>
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<tr>
<td>PHIL 321</td>
<td>Analytic Philosophy</td>
<td></td>
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<tr>
<td>PHIL 331</td>
<td>Continental Philosophy</td>
<td></td>
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<tr>
<td>PHIL 342</td>
<td>Ethical Theory</td>
<td></td>
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<tr>
<td>PHIL 355</td>
<td>Social and Political Philosophy</td>
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<tr>
<td>PHIL 360</td>
<td>Feminist Philosophy</td>
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<tr>
<td>PHIL 383</td>
<td>Asian Philosophy</td>
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<tr>
<td>Select one of the following (Philosophical Topics):</td>
<td>3</td>
<td></td>
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<tr>
<td>PHIL 400</td>
<td>Philosophy of Language</td>
<td></td>
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<tr>
<td>PHIL 410</td>
<td>Metaphysics: What Is Real?</td>
<td></td>
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<tr>
<td>PHIL 415</td>
<td>Philosophy of Mind</td>
<td></td>
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<tr>
<td>PHIL 420</td>
<td>Epistemology: What Is Knowledge?</td>
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<tr>
<td>PHIL 425</td>
<td>Metaethics - Is Ethics Possible?</td>
<td></td>
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<tr>
<td>PHIL 441</td>
<td>Existentialism</td>
<td></td>
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<tr>
<td>PHIL 442</td>
<td>Phenomenology</td>
<td></td>
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<tr>
<td>PHIL 443</td>
<td>Aesthetics</td>
<td></td>
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<tr>
<td>PHIL 450</td>
<td>Philosophy, Economics, and Politics</td>
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<tr>
<td>PHIL 451</td>
<td>Citizenship and Political Participation</td>
<td></td>
</tr>
<tr>
<td>PHIL 460</td>
<td>Philosophy of Law</td>
<td></td>
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<tr>
<td>PHIL 480</td>
<td>Public Philosophy (capstone - required)</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td></td>
<td>9</td>
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</tbody>
</table>

Total Credits 36

Courses in Philosophy

Since a major in philosophy involves a rigorous study of basic questions about human life and action, knowledge, truth, and values, it is recognized as providing a sound base for those who plan to continue their education in one
of the professional specialties such as law, medicine, or the ministry. More recently, liberal arts degrees in fields which “make you think” have become increasingly valued in business and government. Majoring in philosophy also prepares a student for graduate work in any of the humanities (most notably philosophy); in most cases the graduate will pursue a doctoral degree to teach at the college level.

Students majoring in other fields who find themselves seriously interested in the theoretical aspects of their disciplines — e.g. ethical implications of practice, the functions of knowledge in the field, the legitimacy of methods — may want to consider a special concentration, minor, or second major in philosophy to explore that interest. The emphasis of such studies could be philosophy of science and technology, ethics in the professions (engineering, medicine), or aesthetics in literature or fine arts, to name a few examples.

### Language Requirement

Reading proficiency in the philosophical literature of any foreign language is strongly recommended. Majors in philosophy should be aware that proficiency in symbolic logic is expected in most graduate schools and in some substitutes for proficiency in a foreign language.

### B.A. with a Major in Philosophy and Religion: Pre-Law Concentration

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Pre-Law Concentration requirements.

36 major hours, including:

<table>
<thead>
<tr>
<th>Required Courses (18 credits):</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>PHIL 101 Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 110 Introduction to Logic</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 120 Introduction to Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 221 Symbolic Logic</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 460 Philosophy of Law</td>
<td>3</td>
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<tr>
<td>PHIL 480 Public Philosophy</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Ethics Courses (3 credits from the following):</th>
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<tbody>
<tr>
<td>PHIL 251 Ethics in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 252 Ethics in Business and Public Administration</td>
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<tr>
<td>PHIL 253 Environmental Ethics</td>
<td></td>
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<tr>
<td>PHIL 342 Ethical Theory</td>
<td></td>
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<tr>
<td>PHIL 425 Metaethics - Is Ethics Possible?</td>
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<thead>
<tr>
<th>Social-Political Philosophy Courses (9 credits from the following):</th>
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</thead>
<tbody>
<tr>
<td>PHIL 130 Introduction to Political Philosophy</td>
<td>9</td>
</tr>
<tr>
<td>PHIL 312 American Philosophy</td>
<td></td>
</tr>
<tr>
<td>PHIL 355 Social and Political Philosophy</td>
<td></td>
</tr>
<tr>
<td>PHIL 360 Feminist Philosophy</td>
<td></td>
</tr>
<tr>
<td>PHIL 450 Philosophy, Economics, and Politics</td>
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<tr>
<td>PHIL 451 Citizenship and Political Participation</td>
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</table>

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<tr>
<th>Electives (6 credits):</th>
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<tbody>
<tr>
<td>Electives can be earned from classes in Philosophy (PHIL) or Religion (RELS)</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Credits 36

### B.A. with Major in Philosophy and Religion: Religion Concentration

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. Religion Concentration Requirements (33 credit hours):

<table>
<thead>
<tr>
<th>RELS 480 Religion Capstone</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select one of the following (Western Traditions):</td>
<td></td>
</tr>
<tr>
<td>RELS 101 Religions of the West</td>
<td>3</td>
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<tr>
<td>RELS 328 Development of Christian Doctrine</td>
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<tr>
<td>RELS 334 Judaism</td>
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<td>RELS 338 Contemporary Christianities</td>
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<tr>
<td>RELS 355 Islam</td>
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<tr>
<td>Select one of the following (Asian Traditions):</td>
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<tr>
<td>RELS 102 Religions of Asia</td>
<td>3</td>
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<tr>
<td>RELS 315 Daoism and Confucianism</td>
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<tr>
<td>RELS 320 Hinduism</td>
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<tr>
<td>RELS 380 Buddhism</td>
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<td>RELS 410 Asian Religions in the United States</td>
<td>3</td>
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<tr>
<td>Select one of the following (Biblical Studies):</td>
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<tr>
<td>RELS 221 Jewish Scripture/Old Testament</td>
<td></td>
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<tr>
<td>RELS 231 Christian Scripture/New Testament</td>
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<tr>
<td>RELS 300 Jesus in Gospel and History</td>
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<tr>
<td>RELS 301 Life and Religion of Paul</td>
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<tr>
<td>RELS 321 Prophets and Prophecy</td>
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<tr>
<td>Select two of the following (Contemporary Problems and Ideas):</td>
<td>6</td>
</tr>
<tr>
<td>RELS 120 Religion in America</td>
<td></td>
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<tr>
<td>RELS 216 Women and Religion</td>
<td></td>
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<tr>
<td>RELS 245 Death and Dying</td>
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<tr>
<td>RELS 250 East and West in Religion</td>
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<tr>
<td>RELS 305 Mysticism</td>
<td></td>
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<tr>
<td>RELS 309 Atheism, Theism and Secularism</td>
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<td>RELS 342 Religious Ethics</td>
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<tr>
<td>RELS 423 Psychology of Religion</td>
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<td>RELS 431 Religious Violence and the Apocalyptic Mind</td>
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<tr>
<td>RELS 466 Sex, Gender and Religion</td>
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</tbody>
</table>

12 hours of electives may be chosen from any of the above listed courses, 12 as well as RELS 399 Selected Topics; RELS 491 Seminar on Religion; and RELS 494 Independent Studies in Religion.

Total Credits 33

Of the 33 total credits, 18 must be 300-400 level courses. Up to 6 hours of cognate courses, e.g., PHIL 301 Medieval Philosophy; IS 352 Native Philosophies and Religions, may be used to complete electives requirements. Choices must be approved by student’s adviser and by the Department Chair prior to enrollment in the course.

### Courses in Religion

Religions at the University are seen as creative, living modes of experience, culture, beliefs, rituals and ethics—that enable people around the globe to make sense of their lives. By studying, and to a limited degree projecting ourselves into, various religions, we are better able to appreciate the outlooks and values of other societies and gain new insight into what gives meaning and worth to our own lives. The academic study of religion is not based upon assumptions regarding the truth or falsity of any particular religious tradition. Rather, we guide students to learn a variety of scholarly approaches in order to develop their own critical understandings of the subject.

The study of religion is an integral part of a liberal education. It is also an enrichment for courses of study in preparation for careers in business, education, health care, social and psychological services. Courses in religion are a good preparation for many areas of postgraduate studies, including law, medicine, and the ministry. Our curriculum is designed to prepare students to engage actively as responsible citizens in the global community.

### Minor in Philosophy and Religion: Philosophy Concentration

Required 21 credits in Philosophy
Minor in Philosophy and Religion: Religion Concentration

Required 21 credits including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>RELS 100</td>
<td>Introduction to Religious Inquiry</td>
<td>3</td>
</tr>
</tbody>
</table>

Religion Electives * 18 credits

Total Credits 21

* 18 hours, including one course from three of the four areas of study listed under the major. Of the 21 total credits, 12 must be at 300-400 level.

Minor in Ethics

Ethics, the study of right action and the good life, lies at the core of the human experience. It is also essential for those who wish to engage in business, politics, relationships, and self-examination. What ought we to do? How should we live? When should we help others and how often should we help ourselves? Everyone has asked these questions but few have allowed themselves the opportunity to really study them and to examine their own beliefs. The minor in ethics provides just such an occasion.

Through the minor in ethics, students will be able to examine classic texts (of philosophy, religion, and other subjects) and apply their lessons to day-to-day life. Through debates and discussions, students and teachers will identify the assumptions and beliefs that guide people’s actions and ask whether some are preferable to others or, even, whether any ethical approach is defensible at all. The classes in the minor work well with those of other disciplines—whatever your major, ethics can help you do your job better, learn more from your current classes, and prepare yourself for whatever comes your way.

PHIL 120. Introduction to Ethics 3 Credits.

PHIL 342. Ethical Theory 3 Credits.

Select three of the following: 9 credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 250</td>
<td>Ethics in Engineering and Science</td>
<td></td>
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<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care</td>
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<tr>
<td>PHIL 252</td>
<td>Ethics in Business and Public Administration</td>
<td></td>
</tr>
<tr>
<td>PHIL 253</td>
<td>Environmental Ethics</td>
<td></td>
</tr>
<tr>
<td>PHIL 355</td>
<td>Social and Political Philosophy</td>
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<tr>
<td>PHIL 360</td>
<td>Feminist Philosophy</td>
<td></td>
</tr>
<tr>
<td>RELS 245</td>
<td>Death and Dying</td>
<td></td>
</tr>
<tr>
<td>RELS 309</td>
<td>Atheism, Theism and Secularism</td>
<td></td>
</tr>
<tr>
<td>RELS 342</td>
<td>Religious Ethics</td>
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</table>

Select two of the following: 6 credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 425</td>
<td>Metaethics - Is Ethics Possible?</td>
<td></td>
</tr>
<tr>
<td>PHIL 441</td>
<td>Existentialism</td>
<td></td>
</tr>
<tr>
<td>PHIL 450</td>
<td>Philosophy, Economics, and Politics</td>
<td></td>
</tr>
<tr>
<td>PHIL 451</td>
<td>Citizenship and Political Participation</td>
<td></td>
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<tr>
<td>PHIL 480</td>
<td>Public Philosophy</td>
<td></td>
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<tr>
<td>RELS 431</td>
<td>Religious Violence and the Apocalyptic Mind</td>
<td></td>
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<tr>
<td>RELS 466</td>
<td>Sex, Gender and Religion</td>
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</tbody>
</table>

Total Credits 21

For other possibilities, check with advisors in the department.

PHIL Courses

PHIL 101. Introduction to Philosophy. 3 Credits.

An introductory survey of the discipline of philosophy. Students will join the thoughtful search, in which philosophers have engaged through reading and discussion since ancient days, into the problems of reality (metaphysics), of truth and meaning (logic and philosophy of language), of moral standards (ethics), of knowledge (epistemology), of beauty (aesthetics), and other fundamental questions. F.S.

PHIL 110. Introduction to Logic. 3 Credits.

A theoretical and practical introduction to the principles of reasoning—formal and informal, deductive and inductive. Students will study language and patterns of reasoning as vehicles for and obstacles to critical thinking. The central characteristics of deduction and validity; the role of hypotheses, inductive reasoning, probability estimates in scientific and quasi-scientific investigations and other models of critical thinking and their limits will be covered. F.S.

PHIL 120. Introduction to Ethics. 3 Credits.

This course investigates the nature of the Good Life, of moral principles, and the application of moral systems to contemporary debate. These may include questions about the morality of war, capital punishment, sexual behavior, welfare, and so forth. F.S.

PHIL 130. Introduction to Political Philosophy. 3 Credits.

An exploration of the central themes in political theory. Students will study topics such as justification of the state, liberty, justice, equality, rights, democratic participation. The course will include readings from classic and contemporary philosophers, emphasizing the connection between the theoretical issues addressed and contemporary political debates. On demand.

PHIL 221. Symbolic Logic. 3 Credits.

The modern deductive logic of propositions and functions (including relations); logistic systems. Students majoring in mathematics or computer science will be especially welcome in this course. Offered Fall every 3 years.

PHIL 250. Ethics in Engineering and Science. 3 Credits.

This course centers on the ethical issues of particular concern to both citizens and professionals involved in engineering and related technical/scientific fields. We review ethical history and ethical theory in all class discussions. The major focus of the course, however, is on ethical dilemmas, case studies, and codes relevant to contemporary engineering and scientific practice. Issues surveyed include: ethical responsibility of theorists and of applied scientists, risk and negligence in technological enterprises, the limits of knowledge/safety/quality, an update of the two cultures debate. F.S.

PHIL 251. Ethics in Health Care. 3 Credits.

Some ethical problems and ethical guidelines are of particular concern to citizens and to professionals interested in health care fields. Examples are informed consent, abortion, euthanasia, organ transplant policies, professional standards versus patient rights, assisted suicide, ethics of testing/screening, health care policy and reform. Class members will explore such issues through case studies in a context of relevant ethical history and theory. Junior/senior standing encouraged. S.

PHIL 252. Ethics in Business and Public Administration. 3 Credits.

Ethical issues occurring in business and public administration. Basic values promoted or inhibited by people and institutions in these areas will be investigated. Case studies will also be used within a context of ethical theory and history, to explore more defined problems such as unsafe products, employee rights, the relation between business life and personal life, and many more. F., even years.

PHIL 253. Environmental Ethics. 3 Credits.

The course centers on the way that ethics helps us to understand environmental issues. We examine a broad cross-section of environmental issues from a variety of traditional and contemporary ethical frameworks. Issues include sustainability, animal rights, energy consumption, habitat loss, biodiversity, land conservation, and pollution. Class members will explore such issues through case studies in a context of relevant ethical history and theory. Offered Fall every 3 years.

PHIL 300. Ancient Philosophy. 3 Credits.

The ancient Greeks and Romans laid the foundations for even the most contemporary philosophy, and their ideas have had a continuing influence on all Western thought from their time to our own. This course attempts to examine those ideas and the reasons for their persistent relevance. F., even years.

PHIL 301. Medieval Philosophy. 3 Credits.

Philosophy in Western Europe from the end of the Roman Empire to the early 15th Century as reflected in the writings of such thinkers as Boethius, Augustine, Abelard, Aquinas and Ockham. S., odd years.

PHIL 302. Renaissance and Enlightenment. 3 Credits.

Philosophy from the time of Petrarch (c. 1350) to that of the American Revolution as seen in the writings of such philosophers as Bruno, Bacon, Descartes, Spinoza and Hume. This is the period that sees the origins of modern thought. The implications of the work of the philosophers had an important role in shaping contemporary society, including the arts, literature, science, politics, and economics. F., odd years.
PHIL 303. Kant and the Nineteenth Century. 3 Credits.
Philosophy from the "Age of Reason" through the Industrial Revolution as reflected in the writings of Kant and other philosophers such as Hegel, Mill, Marx, and Nietzsche. S, even years.

PHIL 312. American Philosophy. 3 Credits.
A survey of major figures and movements in American philosophy. Offered Fall every 3 years.

PHIL 321. Analytic Philosophy. 3 Credits.
Contemporary developments in Philosophy since the beginning of the 20th century. Offered Spring every 3 years.

PHIL 331. Continental Philosophy. 3 Credits.
This course will investigate philosophical trends in Continental Philosophy, such as: Phenomenology, Existentialism, Critical Theory, Feminism, Hemeneutics, Structuralism, Post-structuralism, Postmodernism, Deconstructionism, Postcolonialism, and Psychoanalysis. Students will study primary works of philosophy by such thinkers as: Adorno, Agamben, Arendt, Baudrillard, Butler, Deleuze, Derrida, Foucault, Gadamer, Habermas, Kristeva, Levinas, Marion, Nancy, Riceouer, and Zizek. Offered Fall every 3 years.

PHIL 342. Ethical Theory. 3 Credits.
This course examines the theoretical foundation of a variety of ethical systems. It expands the core traditional ethical theories by considering contemporary elaborations on Virtue Ethics, Deontological Ethics (Kantianism), utilitarianism and other dominant theories. Students are strongly advised to have taken PHIL 120 before enrolling in this course. S.

PHIL 355. Social and Political Philosophy. 3 Credits.
This course examines core issues in society and governance: the nature of justice, the limits of freedom, the role of religion, family and pluralism in the modern community, are a few examples of possible topics. Students in the course may examine both classical and contemporary theories of political society. Offered Fall every 3 years (2008).

PHIL 360. Feminist Philosophy. 3 Credits.
This course will investigate theories and major ideas of feminist philosophers, past and present. The course may be approached as an historical examination of the different "waves" of feminism, or it may be approached topically, as for example: women and the body, the feminine and the spirit, feminist art, feminist responses to violence, etc. Central figures in feminist philosophy who may be studies include: Charlotte Perkins Gilman, Mary Wollstonecraft, Simone de Beauvoir, Susan Bordo, Catharine MacKinnon, Luce Irigary, bell hooks, and Chandra Talpade Mohanty. Offered Fall every 3 years.

PHIL 383. Asian Philosophy. 3 Credits.
Study of major philosophical systems of India, China and/or Japan. On demand.

PHIL 399. Philosophic Themes. 1-3 Credits.
This course provides an opportunity for detailed examination of important philosophic themes. Topics will vary depending on faculty and student interests. Investigations into philosophy of religion, foundations of logic, African American philosophic schools, political correctness, and many others are possible. May be repeated for a maximum of 6 credits. Repeatable to 6 credits. On demand.

PHIL 400. Philosophy of Language. 3 Credits.
An examination of the nature of language concerning issues of meaning, reference, language use, linguistic structure, and difference from other symbol systems. Offered Spring every 3 years.

A study of the basic categories by which things are understood. Topics include such issues as appearance and reality, substance, particular and general, space and time, and personal identity. Offered Spring every 3 years.

PHIL 415. Philosophy of Mind. 3 Credits.
A consideration of philosophical problems arising from the methodology of the behavioral sciences. Of special relevance to students majoring in Psychology, Political Science, Economics, Anthropology or Sociology. Offered Fall every 3 years.

PHIL 420. Epistemology: What is Knowledge?. 3 Credits.
Inquiry into the nature and limits of knowledge as distinguished from belief; types of knowledge; the role of reason and sense experience in empirical knowledge. Offered Fall every 3 years.

PHIL 425. Metaethics - is Ethics Possible?. 3 Credits.
A study of traditional problems in ethical theory including the foundations of ethical philosophy, the nature of the good, ethical relativity, free will versus determinism. Although case studies and contemporary examples will appear in discussions, the central focus of the course will be historical and theoretical. Offered Fall every 3 years.

PHIL 430. Philosophy of Science and Technology. 3 Credits.
A study of the philosophic aspects of science and technology. Problems include, what makes a theory scientific, is there a scientific "method"?, can one believe in science and religion at the same time?, how can we tell whether a technological enterprise is a reasonable risk or a negligent gamble?, how should a technological advance be controlled? Offered Spring every 3 years.

PHIL 441. Existentialism. 3 Credits.
An examination of the nature of human existence and its relationship to freedom. This course investigates the consequences of one's choices and their effects on identity, ethics, and on other people. By examining the works of such philosophers as Kierkegaard, Sartre, Camus, de Beauvoir, and others, students will investigate the ways in which human beings construct their own identities and develop their own ethical and political standards. Offered Spring every 3 years (2010).

PHIL 442. Phenomenology. 3 Credits.
This course will introduce students to the theory and practice of phenomenology. Founded by the 20th century thinker, Emmanuel Husserl, phenomenology is a method that attempts to describe lived human experiences. Students will therefore do phenomenology as part of their study of the subject by undertaking exercises in the method of phenomenological description. Central figures in phenomenology who may be studied include: Franz Bretano, Edmund Husserl, Martin Heidegger, Emmanuel Lavinas, Maurice Merleau-Ponty, and Paul Ricoeur. The course may also take a topical approach, investigating the experiences of gratitude, foreignness, fear, desire, or hospitality, for example. Offered Fall every 3 years.

PHIL 443. Aesthetics. 3 Credits.
This course will investigate the philosophical foundations of art (understood in its widest sense, including, for example, music and writing). It will ask whether definitions of art or beauty are possible, what the relationship between form and substance is in art, whether or not art should be valued as a product or process, as well as other such questions. The course will rely upon classical and modern texts, as well as a variety of examples from the history of the arts. Offered Spring every 3 years.

PHIL 450. Philosophy, Economics, and Politics. 3 Credits.
This course provides an introduction to the discipline sometimes called "political economy" and illustrates its connection to political philosophy in general. It focuses on the relationship between political and economic structures, with a special emphasis on the nature and problems of liberal capitalist democracies. Students will read classic and contemporary thinkers, and primary and secondary sources. Offered Spring every 3 years.

PHIL 451. Citizenship and Political Participation. 3 Credits.
This course provides an in-depth study of the nature of citizenship, with special emphasis on how citizens deliberate collectively and individually. It focuses on questions of rationality, political activism, political education, and cosmopolitanism. Students will read classic and contemporary thinkers, and primary and secondary sources. Offered Spring every 3 years.

PHIL 460. Philosophy of Law. 3 Credits.
An investigation of the nature of both law and legal reasoning. Study of the nature of law focuses on theories of natural law, legal positivism, and legal realism. Legal reasoning concerns justified interpretation of precedent and statute within the common law tradition. Additional topics dealt with as time allows, encompass such issues as the justification of punishment and enforcement of morality. F.

PHIL 480. Public Philosophy. 3 Credits.
Public philosophy is the process of engaging in philosophical reflection with non-philosophers. This course provides the opportunity for students to take existing work in academic philosophy and "translate" it into more accessible media. Students will write magazine articles, blog entries, opinion pieces suitable for newspapers, and engage in other activities that help philosophy expand past its home at the university. Prerequisite: 75 total credit hours. F.

PHIL 491. Seminar in Philosophy. 3-6 Credits.
A consideration of selected philosophical problems or classic texts of mutual interest to departmental faculty and more advanced students. Previous work in philosophy or related disciplines is recommended. Prerequisites: Junior or senior standing and consent of instructor. On demand.
PHIL 494. Independent Study in Philosophy. 1-3 Credits. 
Supervised tutorial on an individual basis. Typically, a student will work independently to a considerable extent. In other cases, the course may take the form of regularly scheduled meetings. May be repeated to 8 credits. Prerequisite: Instructor consent. Repeatable to 24 credits. F-S.

PHIL 497. Projects in Philosophy. 1-3 Credits. 
Projects in Philosophy is a course that allows students to engage in non-traditional, non-classroom based projects in philosophy. Projects may include internships, practicums, research or teaching assistantships, community engagement activities, or other projects that may differ from semester to semester. Students may enroll in this course with permission of instructor, but some projects (e.g., internships) may be selective and subject to an application process. Repeatable up to 12 credits. Prerequisite: Instructor consent. Repeatable to 12 credits. On demand.

RELS Courses

RELS 100. Introduction to Religious Inquiry. 3 Credits. 
An introduction to the questions posed by those seeking religious truth as well as the methods and tools used by all religious traditions. This course is designed as a foundational entry into the academic study of religion, well suited for students with little or no training in the academic study of religion. F.

RELS 101. Religions of the West. 3 Credits. 
A survey of the classical stories, rituals, and symbols of religious culture in Western civilization from ancient times to the present. F.

RELS 102. Religions of Asia. 3 Credits. 
This course is an introduction to the characteristic beliefs and practices of selected religions that developed in Asia: Hinduism, Buddhism, Confucianism, Daoism and Shinto. We will devote special attention to scriptures and other classic literature of the traditions. Students will gain an appreciation of the vitality and enduring significance of each of the religions as a way of life for large numbers of people. F, odd years.

RELS 120. Religion in America. 3 Credits. 
A study of religious life in America. Emphasis is placed on the role of religion in the development of American life and character. S, even years.

RELS 203. World Religions. 3 Credits. 
A general survey of the beliefs and practices of major world religions, with a focus on Islam, Hinduism, Buddhism, Daoism, and new religious traditions. S.

RELS 216. Women and Religion. 3 Credits. 
An examination of the role of women's experiences in religious thought, symbols and traditions, beginning with the centrality of goddess and mythic female figures, to the shift from matriarchy to patriarchy in the major cultures of the world and the consequential suppression of women's experiences by patriarchal society, up to the current trend towards reformation and reconstruction of traditional religions by contemporary women theologians and religious thinkers. S.

RELS 221. Jewish Scripture/Old Testament. 3 Credits. 
An introduction to the academic study of this ancient literature that includes an investigation of its historical, cultural, and religious contexts, as well as an examination of the fundamental interpretive approaches employed by biblical scholars. F.

RELS 231. Christian Scripture/New Testament. 3 Credits. 
An introduction to the academic study of the New Testament that includes an investigation of its historical, cultural and religious contexts, as well as an examination of the fundamental interpretive approaches employed by biblical scholars. S.

RELS 245. Death and Dying. 3 Credits. 
An examination of various perspectives on death and dying in our own and other cultures with a view to coping with the problems of mortality and immortality. Medical, psychological, philosophical, and religious aspects contributing to an understanding of the meaning of death will be offered by resource people whose experience will lend assistance to the student's confronting the reality of death and dying. Lecture and discussion. S.

RELS 250. East and West in Religion. 3 Credits. 
A critical and comparative study of people's religious orientation between Eastern and Western traditions. F.

RELS 300. Jesus in Gospel and History. 3 Credits. 
A study of one of the most significant personalities in religious history. Biblical and non-biblical texts which have defined and described Jesus will be examined. F.

RELS 301. Life and Religion of Paul. 3 Credits. 
A study of the Pauline themes underlying the Christian faith as seen through the writings of this creative religious personality. Emphasis on current Pauline studies. S.

RELS 305. Mysticism. 3 Credits. 
A study of mystics and their writings from the Eastern and Western traditions and the application of methods of religious inquiry into the presence of mystical phenomena. F.

RELS 309. Atheism, Theism and Secularism. 3 Credits. 
Exploration of the basic theistic and atheistic options regarding the ultimate meaning and value of human life, with a study of the impact the rise of secularism has had on religious faith. On demand.

RELS 315. Daoism and Confucianism. 3 Credits. 
An introduction to two major religious and philosophical traditions indigenous to China and important throughout East Asia. Attention will also be directed to the relations of Daoist and Confucian traditions to the social and political order, from ancient times through the contemporary period. Offered Fall every 3 years (2007).

RELS 320. Hinduism. 3 Credits. 
The Indian subcontinent is one of the great historic centers of world civilization, and it has extended its cultural influence throughout Asia and the world; like China, it now also comprises about one-fifth to one-sixth of the earth's population. This class will introduce students to the region's preponderant religious and philosophical tradition of Hinduism, treating topics such as understandings of God or gods, teachings of a universal Self, reincarnation, views for and against the caste system, and Hinduism and globalization. We will treat examples of Hinduism from the ancient to contemporary periods, devoting special attention to selections of classic texts. Offered Fall every 3 years (2008).

RELS 321. Prophets and Prophecy. 3 Credits. 
This course investigates the religious phenomenon of prophecy in both traditional contexts (ancient Israelite religion and the ancient near east, early Christianity and the Greco-roman world), as well as in its present day manifestations within a variety of indigenous cultures and contemporary religions. Offered Spring every 3 years (2009).

RELS 328. Development of Christian Doctrine. 3 Credits. 
An introduction to the origins of early Christianity as a movement, the struggle among competing interpretations of the Christian faith to establish orthodoxy, and the development of Christian thought and practice through the Protestant Reformation. Offered Fall every 3 years.

RELS 334. Judaism. 3 Credits. 
Comparative Jewish thought in cultural context and as manifest in Jewish literature. Topics to be studied include the sacred, the human community, the role of Israel, ethics, the Holocaust. Offered Spring every 3 years (2010).

RELS 338. Contemporary Christianities. 3 Credits. 
A survey of modern Christian thought from the Protestant Reformation to the contemporary era, with an emphasis on the variety of Christian practices and theologies in the twentieth-first century. Offered Spring every 3 years (2009).

RELS 342. Religious Ethics. 3 Credits. 
Problems concerning the presuppositions of religious ethics and their application to personal moral issues and to such areas of community life as business, race relations, war and peace. On demand.

RELS 355. Islam. 3 Credits. 
This course provides an overview of Islam, the faith of more than one billion persons throughout the world. This course explores the history, beliefs and practices, ethics, writings, and experiences of Muslims in diverse cultures, with an emphasis on understanding the development of Islam in the 20th and 21st centuries. This course develops critical and creative thinking, careful reading and analysis of complex texts and issues, writing and research skills, and the ability to empathize with a diversity of contexts and viewpoints. On demand.

RELS 380. Buddhism. 3 Credits. 
A historical and critical survey of different Buddhist schools in India, China, Tibet, and Japan. Offered Spring every 3 years (2008).

RELS 399. Selected Topics. 1-3 Credits. 
A selected topic in the area of religious studies such as Atheism, Religion and Public Life, Lessons of the Holocaust, Religion and the Environment, Greco-Roman Religion, African American Religious History, Women Religious Writers. Repeatable to 12 credits with different topics. Repeatable to 12 credits. F-S.
RELS 410. Asian Religions in the United States. 3 Credits.
A survey of Asian religions in the U.S., with special attention paid to the ways in which Asian religions are becoming Americanized and American popular culture is becoming Easternized. Offered Spring every 3 years (2009).

RELS 423. Psychology of Religion. 3 Credits.
The psychological significance of various types of religious experience, personal and social. An examination of classical psychological statements about religion including James, Allport, Kierkegaard, Freud, and Jung. S, even years.

RELS 431. Religious Violence and the Apocalyptic Mind. 3 Credits.
This course examines contemporary examples of religious violence by placing them within a broader context of ancient and modern examples of apocalyptic thought. Offered Spring every 3 years.

RELS 466. Sex, Gender and Religion. 3 Credits.
This course presents issues generated by the interrelationship of sex, sexual orientation and gender with religion. Included in our investigation are the various interpretations of sacred texts which produce discourses of sexual control, establish moral authority and seek to define sexual identity. Other discourses are those created from other religious experiences and therefore resist those of the dominant society. On demand.

RELS 480. Religion Capstone. 3 Credits.
This course provides an opportunity for religion majors to reflect further upon, and integrate what they have learned in the religion program and their overall university experience. Topics to be considered include diverse expressions and meanings of religion; cross-cultural understanding and dialogue; the effects on religious studies of patriarchy, colonialism and heterosexism; religion and violence; and religion and contemporary culture. Prerequisite: Junior or Senior standing in the Religion major. F.

RELS 491. Seminar on Religion. 3 Credits.
A consideration of selected topics or religious classics of mutual interest to departmental staff and advanced students in Religion. Prerequisites: Junior or senior standing and some upper level work in Religion or consent of instructor. On demand.

RELS 494. Independent Studies in Religion. 1-3 Credits.
Supervised reading and study on an individual basis. Repeatable to 8 credits. Prerequisite: Instructor consent. Repeatable to 8 credits. F, S.

RELS 497. Projects in Religion. 1-3 Credits.
Projects in Religion is a course that allows students to engage in non-traditional, non-classroom based projects in religious studies. Projects may include internships, practicums, research or teaching assistantships, community engagement activities, or other projects that may differ from semester to semester. Students may enroll in this course with permission of instructor, but some projects (e.g., internships) may be selective and subject to semester to semester. Students may enroll in this course with permission of faculty. Prerequisite: Permission of instructor. Repeatable to 12 credits. On demand.

Physical Therapy (PT)
http://www.med.und.edu/physical-therapy

Danks, Decker, Elbert, Flom-Meland, Jeno, B. Johnson, K. Johnson, LaBrecque, Mabey, P. Mohr, T. Mohr, Relling (Chair), Romanick, Schindler and Wessman

See Physical Therapy (p. 567) in the Graduate Section.

Courses
PT 101. Orientation Physical Therapy. 1 Credit.
Overview of the educational requirements, practice issues, and opportunities in the profession of physical therapy. Course content includes multimedia presentations, lectures, and observation in clinical settings.

PT 402. Professional Communication and Behavior. 2 Credits.
Lecture and practice in interprofessional and interpersonal communication including professional behavior, ethics, patient education, and written documentation. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 409. Clinical Pathology I. 3 Credits.
Selected pathological conditions affecting the musculoskeletal system. Associated orthopedic diagnoses, surgical interventions, the influences of comorbidities and pharmaceutical interventions, and safety concerns are discussed with application to physical therapy patient/client management during orthopedic rehabilitation. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 410. Clinical Pathology II. 3 Credits.
Selected pathological conditions of body systems, associated surgical interventions, the influence of comorbidities, pharmaceutical interventions, and safety concerns are discussed with application to physical therapy patient/client management. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 412. Biomechanics and Kinesiology. 4 Credits.
Biomechanics and kinesiology of musculature acting on the extremities and trunk. Clinical applications and evaluation of joint integrity and mobility, gait, range of motion and muscle performance. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 413. Exercise in Health and Disease. 3 Credits.
Basic foundation for theoretical and practical application of exercise science principles for physical therapists. Exercise science principles are applied to healthy individuals and individuals with disease, impairments, and/or functional limitations. Examination and intervention procedures incorporate aerobic capacity/endurance, anthropometric characteristics, and muscle performance activities. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 415. Motor Control. 3 Credits.
Lecture and laboratory work in therapeutic exercise to establish and maintain muscular control and coordination, including muscle re-education, facilitation, and relaxation. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 417. Clinical Exam and Evaluation I. 4 Credits.
Emphasizes patient/client management elements of examination and evaluation. Emphasis is given to the musculoskeletal and neurological systems. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 420. Musculoskeletal System Examination. 2 Credits.
Principles of musculoskeletal examination and evaluation including identification and palpation of surface anatomy, range of motion (ROM), measurement of joint ROM, and evaluation of muscle performance. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.

PT 422. Anatomy for Physical Therapy. 5 Credits.
Detailed lectures and demonstrations on musculoskeletal anatomy and neuroanatomy. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 423. Neuroscience for Physical Therapy. 4 Credits.
Structure and function of the human nervous system including pathophysiology and clinical applications relevant to physical therapy practice. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.

PT 426. Manual Therapy I. 2 Credits.
Introduction to joint mobilization/manipulation techniques. Emphasis is on mobilization/manipulation as it relates to peripheral joints and soft tissues of the human body. Basic examination, evaluation, and intervention techniques for the spine are also presented. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 435. Introduction to Patient/Client Care and Interventions. 4 Credits.
Basic physical therapy patient care skills addressing multiple areas of physical therapy practice. A sample of topics address injury to the integument, select interventions for all patients, positioning of patients, vital signs, aspetic technique, and basic wheelchair techniques. Laboratory. Prerequisite: Registered in professional physical therapy curriculum. F.

PT 490. Special Topics:Physical Therapy. 1-4 Credits.
Introduction and investigation of advanced clinical procedures and topics. Topics discussed will be dictated by student and faculty interests. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 4 credits. On demand.

PT 491. Independent Study. 1-4 Credits.
Research and independent study in a specialized area of Physical Therapy. Prerequisite: Registered in Professional Physical Therapy Curriculum.
Physics and Astrophysics (Phys)

http://www.arts-sciences.und.edu/physics-astrophysics

Barkhouse, Dewar, Kim (Chair), Loh, Marasinghe, Oncel, Schwalm, Tung and Young

The Department of Physics and Astrophysics offers a B.S. degree, a five-year B.S.-M.S. degree and a minor in physics. Majors may elect to earn a general physics degree or to specialize in one of four tracks. The five physics degree options are:

1. No specialization
2. Applied Physics Track
3. Astrophysics Track
4. Computers in Physics Track
5. Materials Science Track

B.S. with Major in Physics

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings).

II. The Following Curriculum:

Each track leads to a Bachelor of Science with Major in Physics, awarded through the College of Arts and Sciences. A total of 125 credits is required for graduation. In addition to other University Graduation Requirements and the courses specified for one of the five options listed below, all Physics majors must complete successfully the following set of core courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 253</td>
<td>University Physics III</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 317</td>
<td>Mechanics I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; PHYS 318</td>
<td>Mechanics II</td>
<td>6</td>
</tr>
<tr>
<td>PHYS 324</td>
<td>Thermal Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 325</td>
<td>Optics</td>
<td>3</td>
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<tr>
<td>PHYS 325L</td>
<td>Optics Laboratory</td>
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</tr>
<tr>
<td>PHYS 327</td>
<td>Electricity and Magnetism I</td>
<td>6</td>
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<tr>
<td>&amp; PHYS 328</td>
<td>Electricity and Magnetism II</td>
<td>6</td>
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<tr>
<td>PHYS 415</td>
<td>Undergrad Research Experience</td>
<td>3</td>
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<tr>
<td>PHYS 428</td>
<td>Advanced Physics Laboratory</td>
<td>2</td>
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<tr>
<td>PHYS 431</td>
<td>Quantum Mechanics I</td>
<td>6</td>
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<tr>
<td>&amp; PHYS 432</td>
<td>Quantum Mechanics II</td>
<td>6</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<tr>
<td>&amp; CHEM 122</td>
<td>General Chemistry II</td>
<td>6</td>
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<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
<td>2</td>
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<td>MATH 165</td>
<td>Calculus I</td>
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<tr>
<td>&amp; MATH 166</td>
<td>Calculus II</td>
<td>12</td>
</tr>
<tr>
<td>&amp; MATH 265</td>
<td>Calculus III</td>
<td>12</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 352</td>
<td>Introduction to Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>Total Credits</td>
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<td>70</td>
</tr>
</tbody>
</table>

To provide proper advisement, the Department of Physics and Astrophysics requires its majors to meet with their physics advisor prior to registration each semester. This ensures each student is enrolled in appropriate classes and helps the department schedule certain courses in a timely manner. A hold is placed on registration for physics majors until this advisement session takes place. It is the student’s responsibility to schedule the advisement session.

Beyond completion of the core listed above and the general education requirements, all physics majors must complete one of the following options together with additional electives for a total of 125 credits.

I. General Physics option: This is a general physics degree offering maximum flexibility. It is appropriate for students who may seek advanced degrees, for instance, or who are interested in medical school. Beyond the core, the student must complete an additional 9 credits of Physics numbered above 300. No more than 3 credits of these 9 may be in PHYS 492 Special Problems.

II. Applied Physics track: This choice will provide interdisciplinary training in applied physics and applied electronics with emphasis on instrumentation and measurement technique. The aim is to prepare the student to work as part of a research team in an industrial, government or academic setting. In addition to the core, the student must complete:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EE 321</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>EE 308</td>
<td>Electronics Laboratory I</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 402</td>
<td>Computers in Physics</td>
<td>3</td>
</tr>
<tr>
<td>EE 452</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

In addition, students electing the applied physics track should select an instrumentation project as a means of satisfying the research core requirement, PHYS 415 Undergrad Research Experience.

III. Astrophysics track: This option is for students with special interest in astronomy, astrophysics, space exploration or aerospace applications. The following are required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 110</td>
<td>Introductory Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 110L</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 434</td>
<td>Nuclear Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 460</td>
<td>Introduction to Astrophysics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 461</td>
<td>Introduction to Astrophysics II</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

To satisfy the research requirement, PHYS 415 Undergrad Research Experience, students in the astrophysics track should select an approved astrophysics project.

IV. Computers in Physics track: This choice provides extensive experience using computers for running experiments, analyzing data, doing computer simulations and calculations in physics. The student should be prepared to learn programming languages. The following are required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 160</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 161</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 402</td>
<td>Computers in Physics</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

For the Computers in Physics track, students should seek out computational research projects for PHYS 415 Undergrad Research Experience, or laboratory projects involving computer instrumentation.

V. Materials Science track: This option provides the strongest foundation in solid state and materials science. Required are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 320</td>
<td>Introduction to Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 420</td>
<td>Advanced Topics in Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 437</td>
<td>Introductory Solid State Physics</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Students in this track should select approved research projects in materials science as a means of satisfying the PHYS 415 Undergrad Research Experience requirement.
The program will use only the existing courses in the Department of Physics and Astrophysics, Department of Mathematics, and Department of Chemistry.

The program course requirements include the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 251C</td>
<td>University Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 251CL</td>
<td>University Physics I Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 252C</td>
<td>University Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252CL</td>
<td>University Physics II Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 253C</td>
<td>University Physics III</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 253CL</td>
<td>University Physics III Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 317</td>
<td>Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 318</td>
<td>Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 324</td>
<td>Thermal Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 325</td>
<td>Optics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 325L</td>
<td>Optics Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 327</td>
<td>Electricity and Magnetism I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 328</td>
<td>Electricity and Magnetism II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 415</td>
<td>Undergrad Research Experience</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 428</td>
<td>Advanced Physics Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 431</td>
<td>Quantum Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 432</td>
<td>Quantum Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 509</td>
<td>Methods of Theoretical Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 510</td>
<td>Methods of Theoretical Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 539</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 540</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 541</td>
<td>Theory Electricity Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 542</td>
<td>Theory of Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 545</td>
<td>Analytical Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 590</td>
<td>Research</td>
<td>1-16</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 352</td>
<td>Introduction to Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Credits:** 92-107

### Minor in Astrophysics

A minor in astrophysics is offered for students who are interested in an understanding of the astrophysics of stars, galaxies, and the universe. The astrophysics minor cannot be combined with a major or minor in physics.

Required 25 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 110</td>
<td>Introductory Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 110L</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 211 &amp;</td>
<td>College Physics I and</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 212 &amp;</td>
<td>College Physics II and</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 212L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 213 &amp;</td>
<td>College Physics III and</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 213L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or PHYS 251</td>
<td>University Physics I and</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 251L</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits:** 25

### Minor in Physics

Required 20 credits in Physics. The specific courses should be chosen in consultation with the department.

### Courses

**PHYS 101. Survey of Physics & Astrophysics. 1 Credit.**
A survey of a broad range of topics in physics ranging from nanoscience to astrophysics and physics-related educational and career opportunities. Intended to help physics majors and students interested in majoring in physics make informed academic decisions early in their college life. S/U grading. F.

**PHYS 110. Introductory Astronomy. 3 Credits.**
An introductory study of the universe: The solar system, stars, stellar evolution, galaxies, black holes, big bang cosmology, and the accelerating universe. The astronomy laboratory 110L is optional for 1 credit. F.S.

**PHYS 110L. Introductory Astronomy Lab. 1 Credit.**
An introductory study of the universe: The solar system, stars, stellar evolution, galaxies, black holes, big bang cosmology, and the accelerating universe. The astronomy laboratory 110L is optional. F.S.

**PHYS 130. Natural Science-Physics. 4 Credits.**
For non-science majors, this is a hands-on, inquiry-based course on the workings of science. Emphasis is on critical thinking and the use of the scientific method. Topics will include: electricity, force, motion, and energy. The laboratory is a component of this course. S.

**PHYS 140. Physics for Poets. 3 Credits.**
An introduction to the fundamental concepts of physics, especially those developed in the twentieth century. A knowledge of elementary algebra is recommended, but the course is designed for students with a limited mathematical background. No laboratory. On demand.

**PHYS 150. Physics for Aerospace Sciences. 5 Credits.**
An introduction to the principles and concepts of physics as they apply to the study of aerospace sciences. Topics: Newtonian mechanics, gravitation, work, energy, fluids, electricity, and magnetism. F.S.

**PHYS 161. Introductory College Physics I. 4 Credits.**
An introduction to the principles and concepts of physics with the application of minimal mathematics, sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take an advanced course in science. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light and optics. The laboratory is a component of this course. No mathematical prerequisite is required, but knowledge of elementary algebra is recommended. F.

**PHYS 162. Introductory College Physics II. 4 Credits.**
An introduction to the principles and concepts of physics with the application of minimal mathematics, sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take an advanced course in science. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light and optics. The laboratory is a component of this course. Prerequisite: PHYS 161. S.

**PHYS 211. College Physics I. 4 Credits.**
This non-calculus general physics course is recommended for pre-medical or pre-professional students. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, heat and thermodynamics. The laboratory is a component of this course. A student may not receive credit for PHYS 211 and PHYS 212, and also PHYS 161 and PHYS 162. Prerequisite: MATH 103. F.
The BA in Political Science

Students pursuing a BA in Political Science will find a rigorous, dynamic, and intellectually demanding program that will promote academic excellence and civic engagement while preparing students for a wide range of career options.

Political Science students must complete challenging and thought-provoking courses culminating in a capstone. Each course, as well as the entire major sequence, will broaden and deepen student knowledge and build a set of core skills and competencies. The core curriculum includes courses in the major subfields of political science: American Government, Comparative Politics, International Relations, Political Theory, and Public Law. Students will use elective coursework to develop a “curricular pathway.” A student’s curricular pathway may explore one of the prime subfields more deeply; alternatively, the curricular pathway may be applied to more narrowly defined areas of political science. Many of students use elective credit to create a pre-law pathway. Other examples include, Human Rights, Political Behavior, the Politics of Gender or Race, or Public Policy. Another option open to students is to form a generalist concentration by purposefully selecting courses from different subfields to fulfill the elective coursework requirement. Students are encouraged to work closely with their faculty adviser to determine a pathway that is appropriate and desirable. Political Science majors must follow 36 credit hours plus external department requirements.

College of Business and Public Administration

B.A. in Political Science

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).
   - At least a 2.50 GPA overall
   - At least a 2.50 GPA for courses required within the major

III. Core Curriculum:

   Introductory-level coursework
   Select two of the following:
   - POLS 115 American Government I 3
   - POLS 116 State and Local Government 3
   - POLS 120 Global Perspectives 3

   Intermediate-level coursework
   Select two of the following:
   - POLS 220 International Politics 3
   - POLS 225 Comparative Politics 3
   - POLS 250 Introduction to Public Administration 3

   Advanced-level coursework
   - POLS 300 Introduction Research Methods 3
   - POLS 310 Introduction to Political Thought 3
   - POLS 405 Political Behavior 3
   or POLS 432 Public Policy Making Process 3

   A Capstone experience
   - POLS 495 Senior Colloquium in Political Science and Public Administration 3

   Political Science students also will meet the following requirements based on courses offered in other departments:

   1. Level II proficiency in a foreign language
   2. ECON 202 Principles of Macroeconomics or equivalent (3 credits)
   3. ECON 210 Introduction to Business and Economic Statistics or equivalent undergraduate statistics course such as PSYC 241 Introduction to Statistics or SOC 236 Sociological Statistics

Minor in Political Science

Students who minor in political science will complete 21 hours of coursework, including 15 hours of Core courses and at least 6 hours of electives. The minor’s Core normally will include the following courses:

   Introductory-level coursework
   - Select one of the following:
     - POLS 115 American Government I 3
     - POLS 120 Global Perspectives 3

   Intermediate-level coursework
   - Select two of the following:
     - POLS 220 International Politics 3
     - POLS 225 Comparative Politics 3
     - POLS 250 Introduction to Public Administration 3

   Advanced-level coursework
   - Select two of the following:
     - POLS 300 Introduction Research Methods 3
     - POLS 310 Introduction to Political Thought 3
     - POLS 305 American Constitution-Governmental Powers 3
     - POLS 306 American Constitution-Civil Liberties 3
     - POLS 405 Political Behavior 3

   Electives (intermediate level or above) 6

Total Credits 21

POLS 115. American Government I. 3 Credits.
An introduction to political science through the study of the American political system: The Constitution; the political processes; the structure, powers and procedures of the Presidency, Congress, and the Judiciary. F.S.

POLS 116. State and Local Government. 3 Credits.
Structure, function and problems of state and local government; executive, legislative, and judicial processes; federalism and metropolitan government. F.S.

POLS 220. International Politics. 3 Credits.
An introduction to international politics with emphasis on the international system, the major actors, the struggle for power, and the struggle for order. S.

POLS 225. Comparative Politics. 3 Credits.
An introduction to comparative politics with emphasis on the democratic systems of Europe. F.

POLS 250. Introduction to Public Administration. 3 Credits.
Introduction to the development of public administration in the United States and to the concepts and methods used in its practice. The political aspects of the public bureaucracy and contemporary issues are also highlighted. Prerequisite: POLS 115. F.

POLS 300. Introduction Research Methods. 3 Credits.
General consideration of research methods and data analysis in political science and the social sciences. F.

POLS 305. American Constitution-Governmental Powers. 3 Credits.
American Constitution studied in light of U.S. Supreme Court decisions and interpretations; focus on government powers, federal relationships, and economic regulation. F.

POLS 306. American Constitution-Civil Liberties. 3 Credits.
Analyzes U.S. Supreme Court decisions and interpretations which focus on civil liberties; equal protections, due process, First Amendment rights. Prerequisite: POLS 115. S.
POL 308. Intergovernmental Relations. 3 Credits.
Analyses the growing interrelationship of federal, state and local governments with emphasis on financial aspects.

POL 310. Introduction to Political Thought. 3 Credits.
Political thought from classical times to the 19th century with emphasis on issues raised in the works of Plato, Aristotle, St. Agustine, Machiavelli, Hobbes, Locke, Rousseau, Mill, Marx and Nietzsche. F.

POL 318. American Political Thought. 3 Credits.
A historical analysis of the major thinkers and of the streams of thought which molded the political life and institutions of the United States from the Puritans to the present. F.

POL 320. Foreign Policies. 3 Credits.
Examination of the roles of major powers in the international system, with emphasis on the foreign policies of the United States and other major powers. S.

POL 321. International Human Rights. 3 Credits.
Examination of factors that contribute to human rights violations and domestic, multilateral and bilateral efforts to combat such violations with emphasis placed on the changing nature of the international system of states.

POL 323. Issues in Comparative Politics. 3 Credits.
Examination of contemporary issues in comparative politics with particular emphasis on the dynamics of change in political systems. Repeatable to 6 credits. F.

POL 324. Chinese Politics. 3 Credits.
The course evaluates the politics of China following two underlying themes: assessing the changes that have taken place in China since the death of Mao and China's place of prominence on the global stage. Focus is placed on Chinese politics since the economic reforms in the 1970s and the political implications of these reforms. The course also evaluates Chinese public policy with regard to critical issues facing China today. S, odd years.

POL 328. Legislative Processes. 3 Credits.
Emphasis will be placed on the structure, functions, and duties of Congress, as well as congressional elections, patterns of congressional leadership, policy successes and failures, and the relationship between Congress and the federal courts and Congress and the U.S. Presidency. S, even years.

POL 329. Presidential Institutions and Management. 3 Credits.
This course focuses on the intersection of politics and management with the executive branch. Special emphasis is placed on the roles of institutions and critical executive branch actors such as the President in the management and execution of public policy. F, odd years.

POL 351. Women and Politics. 3 Credits.
Role of women in politics, including selection of women for political offices, the political attitudes and behavior of women; and the development of public policy initiatives as they affect or are likely to affect women. S,SS.

POL 361. Nonprofit Management (Undergrad). 3 Credits.
This course is an overview of the management of nonprofit organizations. Content includes the history and legal foundation of nonprofits, leadership, marketing, management of employees and volunteers, and operations management. F, even years.

POL 393. Problems in Political Science. 1-3 Credits.
Students study special topics under the direction and supervision of a member of the staff. Repealable when topics vary. Repeatable to 9 credits. On demand.

POL 397. Cooperative Education. 1-2 Credits.
Compensated on-the-job experience in various areas of political science. Prerequisites: GPA of 3.0, 12 hours in POLS, course related to cooperative experience, and permission of department. Repeatable to 6 credits. S/U grading. On demand.

POL 404. Urban Politics and Administration. 3 Credits.
Analysis of the socio-economic context of urban America and its impact on politics, policy, and administration. Prerequisite: POLS 115. S.

POL 405. Political Behavior. 3 Credits.
A review of the role of the public in a democracy focusing on the formation and content of public opinion, the means of communicating that opinion to government, and the impact of that opinion on policy. Prerequisite: POLS 115. F.

POL 432. Public Policy Making Process. 3 Credits.
Two-thirds of the class is devoted to understanding the stages of the policy process: (1) Problem Identification and Agenda Setting; (2) Policy Formulation; (3) Policy Adoption; (4) Policy Implementation; and (5) Policy Evaluation. The last third applies the model to substantive policy areas such as health, environment, education. Prerequisite: POLS 115. S.

POL 433. Public Administration Behavior and Theory. 3 Credits.
Designed to make students aware of the political and community implications of public administration in a democratic society. Reviews and analyzes the political environment of public administration and considers various techniques for accommodating democratic influences in the administrative process. F.

POL 437. Administrative Processes. 3 Credits.
Exploration of theoretical and practical aspects of personnel and financial management in the public sector. Prerequisite: POLS 250. S.

POL 480. Administrative Internship. 1-3 Credits.
On-the-job training in a governmental position with final report and analysis of the agency by the intern. Prior approval of instructor required before enrollment. Prerequisites: GPA of 3.0, 12 hours in POLS, course related to cooperative experience, and permission of department. S/U grading. F,S.

POL 489. Senior Honors Thesis. 1-15 Credits.
Selected readings with oral and written reports. Consent of instructor required prior to enrollment. Prerequisites: GPA of 3.0 or higher , 12 hours in PolS, course related to readings, and consent of department. F,S.

POL 495. Senior Colloquium in Political Science and Public Administration. 3 Credits.
A capstone course in Political Science designed to integrate the subareas of the discipline. The development of the discipline, its great thinkers, and current directions will be examined. This course is designed for majors only. Prerequisite: Senior standing and 21 hours of POLS credit or consent of the instructor. S.

Psychology (Psyc)

http://www.arts-sciences.und.edu/psychology

Bradley, Derenne, DiLorenzo, Ferraro, Holm (Chair), Kehn, Kelly, King, Legerksi, McDonald, Miller, Petros, Plumm, Poltavski, Ruthig, Terrance, Terrell, Weatherly, and Wise

College of Arts and Sciences

The Department of Psychology offers B.A. and B.S. degrees in psychology, and also a minor in psychology. There is a core curriculum, described herein, that all majors must complete. The Department of Psychology faculty’s expertise is broad and diverse, but merges together to focus on three areas: a) behavioral health, which includes mental health, substance abuse, health promotion, and health disparities especially in rural areas; b) psychology and law, which includes assessment of evidence and testimony, jury decision-making, conflict management, and the effects of government policies and regulations on human behavior; and c) cyberpsychology, which includes cybersecurity and big data issues, behavioral product design, human-computer interactions, and the influence, effect, and analysis of social media and networking.

College of Arts and Sciences

B.A. with Major in Psychology

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

At least 36 major hours, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 303</td>
<td>Research Methods in Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 320</td>
<td>Professional Development &amp; Ethics</td>
<td>1</td>
</tr>
<tr>
<td>PSYC 405</td>
<td>History and Systems of Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>
** At least 3 additional credits of 400-level coursework, NOT including PSYC 405 History and Systems of Psychology, PSYC 489 Senior Honors Thesis, PSYC 492 Individual Projects in Psychology, PSYC 493 Instructional Experiences in Psychology or PSYC 494 Advanced Individual Research

Required in other departments:

Level II proficiency in a foreign language, or equivalent proficiency in American Sign Language

Select 2 of the following (with lab):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Concepts of Biology &amp; 111L and Concepts of Biology Laboratory</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I &amp; 150L and General Biology I Laboratory</td>
</tr>
<tr>
<td>BIOL 151</td>
<td>General Biology II &amp; 151L and General Biology II Laboratory</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel &amp; 204L and Anatomy for Paramedical Personnel Laboratory</td>
</tr>
<tr>
<td>PSYC 330</td>
<td>Biological Bases of Behavior</td>
</tr>
</tbody>
</table>

** B.S. with Major in Psychology**

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The Following Curriculum:

At least 36 major hours, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
</tr>
<tr>
<td>PSYC 303</td>
<td>Research Methods in Psychology</td>
</tr>
<tr>
<td>PSYC 304</td>
<td>Advanced Research Methods</td>
</tr>
<tr>
<td>PSYC 320</td>
<td>Professional Development &amp; Ethics</td>
</tr>
<tr>
<td>PSYC 405</td>
<td>History and Systems of Psychology</td>
</tr>
</tbody>
</table>

Students must complete one of the following (laboratory-based course):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 433</td>
<td>Psychology of Learning</td>
</tr>
<tr>
<td>PSYC 436</td>
<td>Perception</td>
</tr>
<tr>
<td>PSYC 437</td>
<td>Physiology of Behavior and Psychophysiological Measurement</td>
</tr>
<tr>
<td>PSYC 439</td>
<td>Cognitive Psychology</td>
</tr>
</tbody>
</table>

400-level coursework

Students must also complete at least 2 credits of applied experience from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 395</td>
<td>Practical Experiences in Psychology</td>
</tr>
<tr>
<td>PSYC 493</td>
<td>Instructional Experiences in Psychology</td>
</tr>
<tr>
<td>PSYC 494</td>
<td>Advanced Individual Research</td>
</tr>
</tbody>
</table>

** Minor in Psychology**

Required 20 credits, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111</td>
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<td>Introduction to Statistics</td>
</tr>
<tr>
<td>PSYC 303</td>
<td>Research Methods in Psychology</td>
</tr>
</tbody>
</table>

Students receiving teaching certification in secondary education must also include:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
</tr>
</tbody>
</table>

* PSYC 111 Introduction to Psychology is prerequisite to all other psychology classes.
Courses

**PSYC 111. Introduction to Psychology. 3 Credits.**
A survey of the scientific study of behavior and mental processes, with consideration of the nature and scope of psychology as a science and a profession. F.S.

**PSYC 210. Human Sexuality. 3 Credits.**
This course provides an overview of human sexuality—covering anatomical and physiological aspects, psychological aspects, behavioral aspects, and social/cultural aspects. Prerequisite: PSYC 111. S.

**PSYC 241. Introduction to Statistics. 4 Credits.**
Descriptive and inferential statistics as applied to psychological measurement and experimentation. Prerequisites: PSYC 111 and MATH 103. F.S.

**PSYC 250. Developmental Psychology. 4 Credits.**
A survey of the psychology of human life span development including intellectual, social, and emotional aspects of the normal individual and emphasizing childhood and adolescent development. Prerequisite: PSYC 111. F.S.

**PSYC 270. Abnormal Psychology. 3 Credits.**
A survey of the classification, symptoms, and etiology of psychological disorders and behavior pathology. Prerequisite: PSYC 111. F.S.

**PSYC 294. Individual Research. 1-4 Credits.**
Introductory experience as a research assistant in a research laboratory. A total of 45 hours is typically required over the course of the semester per credit. Prerequisite: Consent of instructor. Repeatable to 4 credits. S/U grading.

**PSYC 299. Special Topics in Psychology. 1-3 Credits.**
Repeatable when topics vary. Prerequisite: Consent of instructor. Repeatable. On demand.

**PSYC 301. Industrial and Organizational Psychology. 3 Credits.**
Selection, training, motivation, leadership, job satisfaction, human engineering and working environments as applied to business and industry. Prerequisites: PSYC 111 and any basic statistics course. F.

**PSYC 303. Research Methods in Psychology. 4 Credits.**
Survey of research methods; exposure to and evaluation of psychological research; includes an overview of APA format. Prerequisites: MATH 103 or higher and PSYC 111. Prerequisite or Corequisite: PSYC 241. F,S,SS.

**PSYC 304. Advanced Research Methods. 3 Credits.**
An advanced research methods course. Students will learn how to plan and execute basic psychological experiments, analyze data, and correctly report research findings using APA style. Prerequisite: PSYC 241 and PSYC 303. F,S.

**PSYC 313. Educational Psychology. 3 Credits.**
The study of educational psychology involves both theory and practice. Focusing upon applying the principles of psychology and research to the practice of teaching, the ultimate goal is the understanding and improvement of instruction. Prospective teachers and other professionals in training who will interact with students need to understand how students learn and how that learning varies and is affected by each student's context, culture, and development. This course focuses on the effective application of psychological concepts and principles in the learning and instructional processes. Prerequisite: PSYC 111 or permission of the instructor. Prerequisite or Corequisite: PSYC 250 or permission of the instructor. On demand.

**PSYC 320. Professional Development & Ethics. 1 Credit.**
Exploration of professional endeavors commonly pursued by psychology graduates and understanding of requirements and ethics for those various professions. Prerequisite: PSYC 303. F.S.

**PSYC 330. Biological Bases of Behavior. 4 Credits.**
This course will cover the biological bases of psychology in areas of evolution, genetics, the nervous system, and methodology as they pertain to human behavior. Prerequisites: Psychology major and BIOL 111 or BIOL 150 or BIOL 151 or ANAT 204. S.

**PSYC 331. Behavior Modification and Therapy. 3 Credits.**
Theory and practice in the application of operant and classical conditioning procedures to humans in applied settings. Prerequisite: PSYC 111. S.

**PSYC 335. Health Psychology. 3 Credits.**
A biopsychosocial approach is used to examine basic concepts, theories, and research in health psychology from the perspectives of the patient, caregiver, health care provider, and researcher. Prerequisite: PSYC 111. F, odd years.

**PSYC 355. Adulthood and Aging. 3 Credits.**
Basic findings and theoretical issues in the study of human aging from biopsychological and socio-psychological perspectives with an emphasis on the individual. Prerequisites: PSYC 111 plus 3 credits of psychology. F.

**PSYC 360. Introduction to Personality. 3 Credits.**
Examination of basic concepts in the field of personality. Prerequisite: PSYC 111. F,S.

**PSYC 361. Social Psychology. 3 Credits.**
Research on individual behavior in its social context: how the individual acts upon the social environment, and interacts with other individuals. Prerequisite or Corequisite: PSYC 111. S.

**PSYC 362. Psychology and Law. 3 Credits.**
Psychological examination of the legal system, including what psychologists have learned about the law, the many different legal topics psychologists study, and the great promise that psychology holds for improving the legal system. Prerequisite: PSYC 111. F, odd years.

**PSYC 365. Psychology of Women. 3 Credits.**
Examination of topics relevant to women that are often ignored in traditional psychology courses, such as gender bias in research, gender identity and roles, sexuality and violence. Prerequisite: PSYC 111. S, even years.

**PSYC 366. Conflict Management. 3 Credits.**
This course provides students with an understanding of conflict, its dynamics, major theoretical explanations, and methods of resolution. Students will also learn some basic conflict resolution skills and processes. Prerequisite: PSYC 111.

**PSYC 395. Practical Experiences in Psychology. 1-4 Credits.**
A practical work or volunteer experience associated with the student's academic study of psychology. Arranged by mutual agreement among student, department, and placement site. Repeatable up to 8 credits. Prerequisites: PSYC 396, junior or senior status, and a minimum overall or major GPA of 3.0. Prerequisite or Corequisite: PSYC 320. Repeatable to 8 credits. S/U grading.

**PSYC 397. Cooperative Education. 1-4 Credits.**
A practical work experience associated with the student's academic area of psychology. Arranged by mutual agreement among student, department and employer. Students need to contact the Cooperative Education office. Prerequisites: PSYC 111, junior or senior status, PSYC 303 with a grade of C or above, and a minimum GPA of 2.0. Repeatable to 8 credits. S/U grading.

**PSYC 405. History and Systems of Psychology. 3 Credits.**
A consideration of the historical background and development of problem areas in psychology and a survey of contemporary psychological theories. Prerequisites: PSYC 303 and senior status. F.S.

**PSYC 421. Diversity Psychology. 3 Credits.**
Origins and consequences of psychological differences among individual and groups with special emphasis on sex differences and racial differences. Prerequisites: PSYC 111, PSYC 241, and PSYC 250 or consent of instructor. S, even years.

**PSYC 433. Psychology of Learning. 4 Credits.**
Principles of animal and human learning, with special emphasis on the acquisition, extinction and retention of learned behavior patterns. Course includes recitation and laboratory. Prerequisites: PSYC 111 and PSYC 303. F.

**PSYC 436. Perception. 4 Credits.**
Perceptual basis of behavior. Prerequisites: PSYC 303 and BIOL 111 or BIOL 150 or BIOL 151 or ANAT 204 or PSYC 330. S.

**PSYC 437. Physiology of Behavior and Psychophysiological Measurement. 4 Credits.**
An advanced course covering major topics of physiological psychology while also introducing students to psychophysiological recording techniques used in research. While physiology and anatomy of the central and peripheral nervous systems will be briefly reviewed, students are expected to have basic knowledge of neuroscience, behavioral science, and research methodology. Laboratory time will focus on demonstration and practice of psychophysiological recording techniques and data analysis. Prerequisites: PSYC 303 and BIOL 111 or BIOL 150 or BIOL 151 or ANAT 204 or PSYC 330. F, odd years.
PSYC 439. Cognitive Psychology. 4 Credits. 
An examination of theory and research on attention, memory, language, comprehension, reasoning, problem-solving, and decision-making. Course includes recitation and laboratory. Prerequisites: PSYC 111 and PSYC 303. F, odd years.

PSYC 441. Case-Based Applied Statistics. 3 Credits. 
Emphasis on the hands-on application and interpretation of a variety of descriptive and inferential statistical procedures using a computer software package (SPSS). Prerequisites: PSYC 111, PSYC 241 and PSYC 303. On demand.

PSYC 460. Advanced Social Psychology. 3 Credits. 
In depth examination of the theoretical and empirical literature in social psychology focusing on attitudes, stereotyping and prejudice, interpersonal relationships, social cognition, personality and the self, and group behavior. Prerequisites: PSYC 111, PSYC 303, and PSYC 361 or SOC 361. F.

PSYC 470. Intro Clinical Psychology. 3 Credits. 
A systematic survey of the field of clinical psychology; basic concepts in diagnosis, psychotherapy, research and professional problems. Prerequisites: PSYC 111, PSYC 241, and PSYC 270 or consent of instructor. F.

PSYC 475. Psychological Helping Skills. 2 Credits. 
This course introduces students to basic helping skills used by mental health professionals and reviews empirically supported models of the helping and change process. Students are given frequent opportunities to apply the skills learned. Prerequisites: Senior status, PSYC 111, PSYC 270, and PSYC 303. Prerequisite or Corequisite: PSYC 320. F.

PSYC 486. Conflict Symposium. 3 Credits. 
In-depth study of a current topic in the conflict field in the format of a week-long symposium. Prerequisite: Permission of instructor. SS.

PSYC 489. Senior Honors Thesis. 1-15 Credits. 
Supervised independent study culminating in a thesis. Prerequisite: PSYC 111, consent of the department, and approval of the honors committee. Repeatable to 15 credits. F.S.

PSYC 492. Individual Projects in Psychology. 1-4 Credits. 
This course is intended to provide students with indepth experiences not covered adequately in usual course offerings. These experiences may include independent research projects or extensive readings on topics of interest. Prerequisites: PSYC 111 and consent of instructor. Repeatable to 8 credits. F.S.SS.

PSYC 493. Instructional Experiences in Psychology. 2 Credits. 
Students will receive training and practical experiences in providing instruction in psychology at the collegiate level. Such experiences include serving as an undergraduate teaching assistant or tutor for psychology courses with a faculty mentor. Prerequisites: Junior or senior status, "A" in course they are serving, minimum overall GPA of 3.2 or higher, and permission of instructor. Prerequisites or Corequisites: PSYC 320 and PSYC 492. Repeatable to 8 credits. S/U grading. F.S.SS.

PSYC 494. Advanced Individual Research. 1-4 Credits. 
Advanced experience as a research assistant in a research laboratory. A total of 45 hours is typically required over the course of the semester per credit. Prerequisites: PSYC 303 and consent of instructor. Repeatable to 8 credits. F.S.SS.

PSYC 499. Advanced Special Topics in Psychology. 1-4 Credits. 
Repeatable when topics vary. Prerequisites: PSYC 111 and consent of instructor. Repeatable. On demand.

Public Administration (Pols)

http://business.und.edu/undergraduate/political-science-public-administration/index.cfm

Hand, Harsell, Jensen, Jendrysik, Kassow, Sum (Chair), Urlacher, and Wood

The Department of Political Science and Public Administration offers undergraduate programs leading to the Bachelor of Science with a major or minor in Public Administration. The major introduces students to administrative sciences through coursework in the common core. Students follow either the track in public administration or the nonprofit track. The former prepares students for employment in the public sector and the latter readies students for work in the nonprofit sector. Either track is appropriate for students interested in graduate studies, law school, or teaching.

The Department also offers a graduate program through the School of Graduate Studies leading to the Masters of Public Administration. Some students pursuing the B.S.P.A. choose to simultaneously earn a Master of Public Administration (MPA) through the 5-year combined degree program. See the Graduate (p. 346) section for admission criteria.

B.S.P.A. with Major in Public Administration

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The applicable College of Business and Public Administration Requirements (see BPA listing).

III. Common Core Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>POLS 116 State and Local Government</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>POLS 437</td>
<td>Administrative Processes</td>
<td>3</td>
</tr>
<tr>
<td>POLS 495</td>
<td>Senior Colloquium in Political Science and Public Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 18

All students in the major follow the common core curriculum along with courses in one of the two tracks below: Public Administration or Nonprofit for a total of 33 credit hours to complete the major.

IV. Public Administration track

Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>POLS 250</td>
<td>Introduction to Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 300</td>
<td>Introduction Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>Electives: select two from the following</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td></td>
</tr>
<tr>
<td>ECON 324</td>
<td>Public Finance</td>
<td></td>
</tr>
<tr>
<td>POLS 328</td>
<td>Legislative Processes</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>POLS 329 Presidential Institutions and Management</td>
<td></td>
</tr>
<tr>
<td>POLS 404</td>
<td>Urban Politics and Administration</td>
<td></td>
</tr>
<tr>
<td>POLS 432</td>
<td>Public Policy Making Process</td>
<td></td>
</tr>
</tbody>
</table>

Other courses with academic advisor approval

Total Credits 15

V. Nonprofit track

Required:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 200</td>
<td>Introduction to theNonprofit Sector</td>
<td>3</td>
</tr>
<tr>
<td>POLS 361</td>
<td>Nonprofit Management (Undergrad)</td>
<td>3</td>
</tr>
<tr>
<td>POLS 480</td>
<td>Administrative Internship</td>
<td>3</td>
</tr>
<tr>
<td>Electives: select two from the following</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>MGMT 306</td>
<td>American Constitution-Civil Liberties</td>
<td></td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td></td>
</tr>
<tr>
<td>POLS 321</td>
<td>International Human Rights</td>
<td></td>
</tr>
<tr>
<td>POLS 351</td>
<td>Women and Politics</td>
<td></td>
</tr>
<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
<td></td>
</tr>
</tbody>
</table>

The hand, Harsell, Jensen, Jendrysik, Kassow, Sum (Chair), Urlacher, and Wood.
Other courses with academic advisor approval

POLS 250 Introduction to Public Administration 3
POLS 300 Introduction Research Methods 3
POLS 404 Urban Politics and Administration 3
POLS 432 Public Policy Making Process 3
POLS 437 Administrative Processes 3

Select two of the following: 6
- ECON 324 Public Finance
- POLS 328 Legislative Processes
- POLS 329 Presidential Institutions and Management
- POLS 433 Public Administration Behavior and Theory
- POLS 480 Administrative Internship
- SOC 431 Workplace Dynamics

Total Credits 21

Note: Other courses may be elected with the consent of the Department.

POLS 115. American Government I. 3 Credits.
An introduction to political science through the study of the American political system: The Constitution; the political processes; the structure, powers and procedures of the Presidency, Congress, and the Judiciary. F.S.

POLS 116. State and Local Government. 3 Credits.
Structure, function and problems of state and local government; executive, legislative, and judicial processes; federalism and metropolitan government. F.S.

POLS 250. Introduction to Public Administration. 3 Credits.
Introduction to the development of public administration in the United States and to the concepts and methods used in its practice. The political aspects of the public bureaucracy and contemporary issues are also highlighted. Prerequisite: POLS 115. F.

POLS 300. Introduction Research Methods. 3 Credits.
General consideration of research methods and data analysis in political science and the social sciences. F.

POLS 308. Intergovernmental Relations. 3 Credits.
Analyzes the growing interrelationship of federal, state and local governments with emphasis on financial aspects.

POLS 328. Legislative Processes. 3 Credits.
Emphasis will be placed on the structure, functions, and duties of Congress, as well as congressional elections, patterns of congressional leadership, policy successes and failures, and the relationship between Congress and the federal courts and Congress and the U.S. Presidency, S. even years.

POLS 329. Presidential Institutions and Management. 3 Credits.
This course focuses on the intersection of politics and management with the executive branch. Special emphasis is placed on the roles of institutions and critical executive branch actors such as the President in the management and execution of public policy. S, odd years.

POLS 404. Urban Politics and Administration. 3 Credits.
Analysis of the socio-economic context of urban America and its impact on politics, policy, and administration. Prerequisite: POLS 115. S.

POLS 432. Public Policy Making Process. 3 Credits.
Two-thirds of the class is devoted to understanding the stages of the policy process: (1) Problem Identification and Agenda Setting; (2) Policy Formulation; (3) Policy Adoption; (4) Policy Implementation; and (5) Policy Evaluation. The last third applies the model to substantive policy areas such as health, environment, education. Prerequisite: POLS 115. S.

POLS 433. Public Administration Behavior and Theory. 3 Credits.
Designed to make students aware of the public and community implications of public administration in a democratic society. Reviews and analyzes the political environment of public administration and considers various techniques for accommodating democratic influences in the administrative process. F.

POLS 437. Administrative Processes. 3 Credits.
Explanation of theoretical and practical aspects of personnel and financial management in the public sector. Prerequisite: POLS 250. S.

POLS 480. Administrative Internship. 1-3 Credits.
On the job training in a governmental position with final report and analysis of the agency by the intern. Prior approval of instructor required before enrollment. Prerequisites: GPA of 3.0, 12 hours in POLS, course related to cooperative experience, and permission of department. S/U grading. F.S.

POLS 493. Professional Project Public Administration. 3 Credits.
An independent study where students will independently develop a paper under supervision, which demonstrates the ability to use the knowledge and skills of public administration to address public administration issues. Prerequisite: Senior standing. S.

POLS 495. Senior Colloquium in Political Science and Public Administration. 3 Credits.
A capstone course in Political Science designed to integrate the subareas of the discipline. The development of the discipline, its great thinkers, and current directions will be examined. This course is designed for majors only. Prerequisite: Senior standing and 21 hours of POLS credit or consent of the instructor. S.

Note: Additional elective courses are listed under Political Science.

Recreation and Tourism Studies (RTS)

http://education.und.edu/counseling-psychology-and-community-services/recreation-tourism/index.cfm

Schroeder (Program Coordinator) and Burke

The belief that individuals and society benefit from recreational pursuits, tourism, and travel experiences underlies the mission of the Recreation and Tourism Studies program, which is to promote enhanced quality of life through recreation, tourism, travel, leisure and activity for the people of North Dakota and beyond. The Recreation and Tourism Studies program works toward this mission through the professional preparation of students for careers in the recreation, tourism, and parks; developing students’ theoretical bases of knowledge and analytical skills; and contributing to society and the profession through the development of a program of research and other scholarly activity, providing leadership and technical assistance to local and regional organizations, and being actively involved in professional organizations on the state, regional, and national levels.

Educational Programs

Part of the Department of Counseling Psychology and Community Services, the Recreation and Tourism Studies program offers a major which leads to a Bachelor of Science degree in Recreation and Tourism Studies.

College of Education and Human Development

B.S. in Recreation and Tourism Studies

Students may apply for admission to the Recreation and Tourism Studies program at any time following the completion of 24 semester hours. A cumulative GPA of 2.20 or higher and successful completion of PSYC 111 Introduction to Psychology, SOC 110 Introduction to Sociology and COMM 110 Fundamentals of Public Speaking are required for admission. Students interested in admission should consult the RTS program.

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The College of Education and Human Development Requirements (see EHD listing).

III. Recreation and Tourism Studies Prerequisites:
Rehabilitation and Human Services (RHS)


Perry (Program Coordinator), Dolence, and Walton

People with disabilities are experiencing greater community integration in our society than ever before. Enhancing that integration and promoting the full acceptance and empowerment of these individuals is central to the mission of the Rehabilitation and Human Services program. This interdisciplinary program prepares students for a wide variety of rehabilitation-related careers in which they will have the opportunity to advance the maximum level of social and economic independence of persons with physical, intellectual, learning, and psychiatric disabilities.

The program offers a Bachelor of Science degree in Rehabilitation and Human Services. In addition, a minor in Rehabilitation and Human Services is offered. These programs are administered by the Department of Counseling Psychology and Community Services, which is part of the College of Education and Human Development.

Students may apply for admission to the Rehabilitation and Human Services major at any time after the completion of 45 semester credits (including RHS 250 Contemporary Issues in Rehabilitation). An overall GPA of 2.5, completion of 40 hours of rehabilitation-related volunteer work, and a written statement of interest in professional rehabilitation practice are also required for admission. Students interested in applying for admission should contact the program coordinator.

To encourage students who are majoring in Rehabilitation and Human Services to extend their studies to include a graduate degree, the Department of Counseling Psychology and Community Services offers a Combined Program in Counseling with a Rehabilitation Emphasis. The Combined Program allows students to earn a bachelor’s degree in Rehabilitation and Human Services and a master’s degree in Counseling with a Rehabilitation Emphasis in approximately five years. This would be a year less than is typically required to complete these degrees separately. Please see Counseling Psychology and Community Services (p. 420) in the Graduate section of the catalog.

College of Education and Human Development

B.S. in Rehabilitation and Human Services

Required 125 credits which must include the following:

I. Essential Studies Requirements (see University ES listing).

Minor in Recreation and Tourism Studies

Required for the Recreation and Tourism Studies minor:

20 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTS 201</td>
<td>Recreation and Society</td>
<td>3</td>
</tr>
<tr>
<td>RTS Courses</td>
<td>(Approved by an RTS advisor)</td>
<td>17</td>
</tr>
</tbody>
</table>

Total Credits 20

Courses

RTS 201. Recreation and Society. 3 Credits.
Orientation to recreation, including the role of recreation in American society and diverse populations, cultures, and nationalities. F.S.

RTS 204. Group Leadership. 3 Credits.
Development of understanding of and ability to utilize leadership and group facilitation strategies to enhance individual’s recreation and tourism experiences. F.

RTS 272. Recreation and the Natural Environment. 3 Credits.
An overview of the use of natural environments as formal and informal settings for leisure and recreation involvement and the interrelationship among people, the environment and leisure. F.

RTS 322. Recreation Program and Event Planning. 3 Credits.
Development of programming skills for recreation programs and special events in various settings. Prerequisite: RTS 201. F.

RTS 323. Recreation Program and Event Implementation. 3 Credits.
Implementation and evaluation of programs planned in RTS 322. Prerequisite: RTS 322. S.

RTS 397. Cooperative Education in Recreation and Leisure Services. 1-4 Credits.
A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. Repeatable to 16 credits. Prerequisite: RTS 201. Repeatable to 16 credits. S/U grading. F.S.SS.

RTS 398. Field Experience in Recreation and Leisure Services. 1-8 Credits.
Placement of student in a practical setting under university faculty supervision. Repeatable to 8 credits. Prerequisites: Consent of instructor and upper division status. Repeatable to 8 credits. S/U grading. On demand.

RTS 399. Special Topics in Recreation and Leisure Services. 1-4 Credits.
Specialized topics related to recreation and leisure. Repeatable to 9 credits. Repeatable to 9 credits. On demand.

RTS 421. Research and Evaluation Methods. 3 Credits.
Introduction to the recreation, parks and leisure services profession. Prerequisites: RTS 322 and senior standing in the RTS or RHS major. S.

RTS 442. Recreation Administration. 3 Credits.
An examination of theories and principles of administration for recreation services. S.

RTS 494. Directed Studies in Recreation and Leisure Services. 1-4 Credits.
An indepth study in a subject area selected by the student under tutorial supervision. Prerequisites: Consent of instructor. Repeatable to 4 credits. F.S.

RTS 497. Internship in Recreation Tourism Studies. 4-12 Credits.
Development of professional skills by working directly with established tourism, recreation and human services organizations under the supervision of approved professionals and faculty. Prerequisite: Recreation and Tourism Studies majors only. S/U grading. SS.
II. College of Education and Human Development requirements (see EHD listing).

III. Core Curriculum (36 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
</tr>
<tr>
<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
</tr>
<tr>
<td>RHS 250</td>
<td>Contemporary Issues in Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>RHS 350</td>
<td>Overview of Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>RHS 450</td>
<td>Vocational Assessment and Job Acquisition</td>
<td>3</td>
</tr>
<tr>
<td>RHS 455</td>
<td>Rehabilitation Process</td>
<td>3</td>
</tr>
<tr>
<td>RHS 375</td>
<td>Senior Capstone Seminar</td>
<td>3</td>
</tr>
<tr>
<td>RHS 497</td>
<td>Internship in Rehabilitation</td>
<td>9</td>
</tr>
</tbody>
</table>

Any Research Methods Class, e.g.:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 323</td>
<td>Sociological Research Methods</td>
<td>3-4</td>
</tr>
<tr>
<td>or PSYC 303</td>
<td>Research Methods in Psychology</td>
<td></td>
</tr>
</tbody>
</table>

Any Statistics Course, e.g.:

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
<td>3-4</td>
</tr>
<tr>
<td>or PSYC 241</td>
<td>Introduction to Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 36-38

IV. Extra Departmental Requirements (13 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 360</td>
<td>Introduction to Personality</td>
<td>3</td>
</tr>
<tr>
<td>SOC 361</td>
<td>Social Psychology (Psyc 361 also acceptable)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 13

V. At Least One Concentration from the Following (10 credits):

**Substance Abuse**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 315</td>
<td>Substance Use and Abuse</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
<td></td>
</tr>
<tr>
<td>RHS 260</td>
<td>Inclusion in Recreation Settings</td>
<td></td>
</tr>
<tr>
<td>PPT 315</td>
<td>Human Pharmacology</td>
<td></td>
</tr>
<tr>
<td>PPT 410</td>
<td>Drugs Subject to Abuse</td>
<td></td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td></td>
</tr>
<tr>
<td>SOC 355</td>
<td>Drugs and Society</td>
<td></td>
</tr>
</tbody>
</table>

Other courses as approved by Program Coordinator

**Mental Health**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHS 375</td>
<td>Community Living Topics (Severe Mental Illnesses)</td>
<td></td>
</tr>
<tr>
<td>RHS 260</td>
<td>Inclusion in Recreation Settings</td>
<td></td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 360</td>
<td>Introduction to Personality</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td></td>
</tr>
</tbody>
</table>

Other courses as approved by Program Coordinator

**Gerontology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHS 260</td>
<td>Inclusion in Gerontology</td>
<td></td>
</tr>
<tr>
<td>SWK 313</td>
<td>Orientation to Gerontology</td>
<td></td>
</tr>
<tr>
<td>PSYC 355</td>
<td>Adulthood and Aging</td>
<td></td>
</tr>
<tr>
<td>SOC 352</td>
<td>Aging and Society</td>
<td></td>
</tr>
<tr>
<td>NURS 490</td>
<td>Transcultural Health Care Theories, Research, and Practice</td>
<td></td>
</tr>
</tbody>
</table>

Other courses as approved by Program Coordinator

**Developmental Disabilities**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHS 375</td>
<td>Community Living Topics (Developmental Disabilities)</td>
<td></td>
</tr>
<tr>
<td>RHS 260</td>
<td>Inclusion in Recreation Settings</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of Exceptional Students</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td></td>
</tr>
</tbody>
</table>

Other courses as approved by Program Coordinator

At least 10 credits from related fields such as the following: 10

Criminal Justice

---

### Minor in Rehabilitation and Human Services

(20 credits)

I. Required Courses (15 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
</tr>
<tr>
<td>RHS 250</td>
<td>Contemporary Issues in Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>RHS 350</td>
<td>Overview of Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>or OT 432</td>
<td>Medical Science II</td>
<td></td>
</tr>
<tr>
<td>or PT 409</td>
<td>Clinical Pathology I</td>
<td></td>
</tr>
<tr>
<td>or NURS 420</td>
<td>Interprofessional Health Care</td>
<td></td>
</tr>
<tr>
<td>RHS 450</td>
<td>Vocational Assessment and Job Acquisition</td>
<td>3</td>
</tr>
<tr>
<td>RHS 455</td>
<td>Rehabilitation Process</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 15

II. Elective Courses (5 credits from the following):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>CSD 343</td>
<td>Language Development</td>
<td>3</td>
</tr>
<tr>
<td>NURS 490</td>
<td>Transcultural Health Care Theories, Research, and Practice</td>
<td></td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
</tr>
<tr>
<td>RHS 375</td>
<td>Community Living Topics</td>
<td>3</td>
</tr>
<tr>
<td>RHS 260</td>
<td>Inclusion in Recreation Settings</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses

**RHS 200. Helping Skills in Community Services. 3 Credits.**

This course provides the student with the basic knowledge and skills associated with the helping process, including interviewing skills, as practiced in a variety of community services settings. A special focus will be on the problem-solving process and interaction skills used in direct service activities with individuals. Helping skills require a knowledge of interpersonal relationships and the effective use of interpersonal behaviors. This combination of knowledge and skills will benefit any individual wanting to increase effectiveness when working with people. F,S,SS.

**RHS 250. Contemporary Issues in Rehabilitation. 3 Credits.**

This course introduces students to the profession of rehabilitation and examines how persons with disabilities are treated in our society. Topics include: community and national rehabilitation agencies, political and social influences on rehabilitation programs, conceptualization of disability, attitude development and change, building accessible and inclusive communities, and transforming the media. Opportunities for involvement with agencies providing rehabilitation services will be provided. S,SS.

**RHS 260. Inclusion in Recreation Settings. 3 Credits.**

Study of individuals with disabling conditions and their leisure-related needs with emphasis on integration strategies and legislation that facilitate community involvement. F.S.

**RHS 350. Overview of Disabilities. 3 Credits.**

This course provides an overview of physical and mental disabilities for rehabilitation professionals, including the medical, psychological, social, and vocational aspects of specific disabilities. Medical terminology, etiology, treatment, interventions, and prognosis of various disabilities will be presented. Prerequisite: RHS 250 or consent of instructor. F.
RHS 375. Community Living Topics. 3 Credits.
This course provides an introduction to independent living for special populations, such as individuals with physical disabilities, developmental disabilities, or serious emotional disturbances. Topics include community-based programming, the deinstitutionalization movement, legislative issues, and the concepts of integration, inclusion, and normalization. Repeatable to a maximum of 6 credits. Repeatable to 6 credits. F,S,SS.

RHS 450. Vocational Assessment and Job Acquisition. 3 Credits.
Review of the basic principles of testing along with various instruments and techniques used in the assessment of persons with disabilities. Use of assessment information in the job acquisition process and the importance of work for individuals with disabilities are also addressed. S.

RHS 455. Rehabilitation Process. 3 Credits.
This course examines the history, philosophy, and ethical standards of the rehabilitation profession. Topics include the following: experiences of people with disabilities throughout history, legislation affecting persons with disabilities, public and private rehabilitation systems, case management principles, role and function of rehabilitation counselors, principles of independent living, and community resources utilized in rehabilitation programs. F.

RHS 493. Senior Capstone Seminar. 3 Credits.
This seminar is designed to integrate the rehabilitation and human services curriculum with actual rehabilitation practice while in the internship. This is accomplished through journals, written assignments, oral presentations, and seminar discussions. The philosophical and ethical base of the profession will be explored, along with the analysis of critical thinking and effective decision making skills. Prerequisite: RHS 455 or consent of instructor. F,S,SS.

RHS 497. Internship in Rehabilitation. 9 Credits.
This course will allow students to apply theory to practice within the field of rehabilitation services. A 400-hour educationally-focused internship in an approved rehabilitation setting will provide an opportunity to integrate rehabilitation knowledge, values, and skills at the beginning level of professional practice. Prerequisite: RHS 455 or consent of the instructor. Corequisite: RHS 493. S/U grading. F,S,SS.

RHS 499. Special Topics. 1-3 Credits.
Supervised instruction or research which explores topics related to rehabilitation and human services. Repeatable to 12 credits. Prerequisite: Consent of instructor. Repeatable to 12 credits. F,S,SS.

Social Science

The Bachelor of Arts in Social Sciences provides a degree program that facilitates study across the academic disciplines in social science. It is designed for students whose academic interest or career objectives require an individualized approach.

This option allows students to design and create their own program of study in conjunction with ongoing consultation with an academic advisor in the College of Arts & Sciences. It consists of Essential Studies requirements and major requirements.

Students wishing to complete a “teaching major” in Social Science should instead follow the BEdEd program in Social Studies (see Department of Teaching and Learning (p. 241) listing).

College of Arts and Sciences

B.A. with Major in Social Science

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. At least 60 credits (24 of which must be upper division) from at least 3 of the following departments: Anthropology, Criminal Justice, Economics, Geography*, History, Political Science, Psychology, and Sociology.

Students may also choose to complete an optional subplan for directed study around a theme:

Health and Human Services
2. Overall GPA of 2.75
3. Grade of C or higher in SWK 255 Introduction to Social Work and SWK 257 Human Behavior and the Social Environment I
5. Completion of 45 semester hours of coursework at the end of the term in which the application is submitted.
6. Students may apply during any term including fall, spring, or summer. Deadlines will be published each term on the Department of Social Work web page. To apply for admission to the program, students complete the application, available on the Department’s website, in consultation with their advisor.
7. Distance BSSW students are admitted only in the Fall, and must apply by the Summer deadline posted on the Department of Social Work website.

The application process is competitive. All factors including grade point average, strength of written materials, and volunteer experience will be given consideration in admissions decisions. The BSSW Program Director will notify the student of the decision regarding admission. Following admission, students are required to complete an assessment process.

Provisional admission may be considered when a student:
1. requests such admission;
2. is making steady progress towards meeting the admissions criteria;
3. has a workable plan for success, including a timeline for achievement; and
4. has met with the advisor. The plan must be approved by the student, the advisor and the BSSW Program Director.

Progression Through the Program and Graduation Requirements

After admission to the social work program, a student must maintain an overall GPA of 2.75, and a GPA of 2.75 in all social work courses. Students must attain a C or better in social work courses. Transfer credit for courses follows university and Council on Social Work Education (CSWE) requirements. All transfer social work courses must be from an accredited BSSW program.*

No credit is given for life experience. Students must complete the required social work courses (39 credit hours).

Field Education comprises 12 credits of BSSW students’ requirements. The Field Education placement in a human service organization is the capstone experience for BSSW students. It integrates knowledge, values and skills from completed social work courses. These courses fulfill the capstone requirement for essential studies at UND. Application dates will be published on the Social Work website each term.

Students are required to complete a background check.

* See articulation agreements for exceptions.

Licensing and Professional Organizations

All students are encouraged to participate in the Student Social Work Club. All students are encouraged to participate in the Student Social Work Club. Students who qualify for Phi Alpha, the National Social Work Honor Society, will be invited to join. Students are eligible for membership in the National Association of Social Workers. Graduates are eligible to apply for licensing at the bachelors level in states that require credentialing.

Addiction Counselor Training Program

The Department of Social Work is designated as an Addiction Counselor Training Program by the North Dakota Board of Addiction Counseling Examiners. Students who successfully complete the course of study, the clinical training requirements and the licensure examination are eligible for licensing as addiction counselors in the State of North Dakota.

Students must apply for admittance into a board approved Clinical Training Program. Applications are accepted once per year on February 1, and if admitted to this competitive program, the 1,400-hour practicum begins the following Fall semester.

Students are admitted to the addiction counselor training on two levels. The first level includes social work majors (students from related disciplines may also apply) who also complete the minor in Chemical Dependency (required courses for licensing in addiction counseling, or their equivalent) and the nine-month/1,400 hour practicum in a certified addiction facility. Students must meet all requirements for a social work major in addition to the minor requirements and the addiction practicum requirement. This generally involves a five-year program of study.

The second level relates to graduate students in Counseling who must meet the required graduate program of study, the required addiction courses, and the nine-month practicum. For more complete details, please contact the Department of Social Work or the Department of Counseling Psychology and Community Services.

Second Degree Program (p. 235)

College of Nursing and Professional Disciplines

B.S. in Social Work

Required 125 credits (36 of which must be numbered 300 or above, 60 of which must be from a 4-year institution, and the last 30 credits at UND) including:

I. Essential Studies Requirements (see University ES listing).

II. The following curriculum.

Social Work

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 255</td>
<td>Introduction to Social Work</td>
<td>4</td>
</tr>
<tr>
<td>SWK 257</td>
<td>Human Behavior and the Social Environment I</td>
<td>3</td>
</tr>
<tr>
<td>SWK 317</td>
<td>Social Work Research</td>
<td>3</td>
</tr>
<tr>
<td>SWK 357</td>
<td>Human Behavior and the Social Environment II</td>
<td>3</td>
</tr>
<tr>
<td>SWK 424</td>
<td>Generalist Social Work Practice with Individuals and Families</td>
<td>3</td>
</tr>
<tr>
<td>SWK 434</td>
<td>Generalist Social Work Practice with Task and Treatment Groups</td>
<td>3</td>
</tr>
<tr>
<td>SWK 442</td>
<td>Social Policy</td>
<td>3</td>
</tr>
<tr>
<td>SWK 454</td>
<td>Generalist Social Work Practice with Communities and Organizations</td>
<td>3</td>
</tr>
<tr>
<td>SWK 481</td>
<td>Field Education I</td>
<td>5</td>
</tr>
<tr>
<td>SWK 482</td>
<td>Field Education Seminar I</td>
<td>1</td>
</tr>
<tr>
<td>SWK 483</td>
<td>Field Education II</td>
<td>5</td>
</tr>
<tr>
<td>SWK 484</td>
<td>Field Education Seminar II</td>
<td>1</td>
</tr>
<tr>
<td>Social Work Elective</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Liberal Arts Requirements for Social Work majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Social Sciences Courses (200-level or above)</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Global Diversity or United States Diversity courses (cannot double count for essential studies)</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 69

Courses used to fulfill the approved minor requirements may also be used to meet the above requirements whenever appropriate and applicable.

Second Degree Program

The student who has secured a bachelor’s degree in a related field and wishes to secure a bachelor’s degree in social work can complete the “Second Degree Program.” The Second Degree Program allows a student to secure a BSSW in one year. Satisfactory completion of a bachelor’s degree in a related field and prerequisites or corequisite of statistics and human biology from an accredited institution are required. Second Degree students must fulfill essential studies requirements or have the equivalent to graduate with a BSSW degree from UND.
If accepted into the Second Degree Program, the schedule to complete the undergraduate degree in one year* is as follows:

**Full-Time Second Degree Schedule for BSSW (40 hours)**

<table>
<thead>
<tr>
<th>Summer</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 481 Field Education I</td>
<td>5</td>
</tr>
<tr>
<td>SWK 482 Field Education Seminar I</td>
<td>1</td>
</tr>
<tr>
<td>SWK 483 Field Education II</td>
<td>5</td>
</tr>
<tr>
<td>SWK 484 Field Education Seminar II</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credits | 12

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 255 Introduction to Social Work</td>
<td>4</td>
</tr>
<tr>
<td>SWK 257 Human Behavior and the Social Environment I</td>
<td>3</td>
</tr>
<tr>
<td>SWK 317 Social Work Research</td>
<td>3</td>
</tr>
<tr>
<td>SWK 424 Generalist Social Work Practice with Individuals and Families</td>
<td>3</td>
</tr>
</tbody>
</table>

Social Work Elective | 2

Total Credits | 15

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 357 Human Behavior and the Social Environment II</td>
<td>3</td>
</tr>
<tr>
<td>SWK 434 Generalist Social Work Practice with Task and Treatment Groups</td>
<td>3</td>
</tr>
<tr>
<td>SWK 442 Social Policy</td>
<td>3</td>
</tr>
<tr>
<td>SWK 454 Generalist Social Work Practice with Communities and Organizations</td>
<td>3</td>
</tr>
</tbody>
</table>

Credits | 12

Total Credits | 39

* Students needing to fulfill essential studies requirements may require a longer period to complete the Fast Track.

**Elective Social Work Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 311 Child Welfare</td>
<td>3</td>
</tr>
<tr>
<td>SWK 312 Social Work and the Legal Process</td>
<td>2</td>
</tr>
<tr>
<td>SWK 313 Orientation to Gerontology</td>
<td>3</td>
</tr>
<tr>
<td>SWK 315 Substance Use and Abuse</td>
<td>2</td>
</tr>
<tr>
<td>SWK 316 Interprofessional Health Care</td>
<td>1</td>
</tr>
<tr>
<td>SWK 318 Mental Health</td>
<td>2</td>
</tr>
<tr>
<td>SWK 397 Cooperative Education</td>
<td>1-4</td>
</tr>
<tr>
<td>SWK 489 Senior Honors Thesis (repeatable to a maximum of 6 credits)</td>
<td>1-3</td>
</tr>
<tr>
<td>SWK 493A Special Topics (repeatable to a maximum of 9 credits)</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Total Credits | 20-23

* Course required for licensing in addiction counseling in North Dakota and Minnesota.

† Student must be senior status or graduate level to enroll in this course.

**Minors**

Students may also choose a minor outside the College of Nursing and Professional Disciplines and the Department of Social Work. The student should consult with the respective College and Department for course requirements for their chosen minor.

**Gerontology Minor**

The interdisciplinary minor in gerontology enhances professionals’ capacity to work with older persons. It requires four courses in four disciplines. Students select another 9 credits to earn 20 credits in coursework related to gerontology.

Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 313 Orientation to Gerontology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 284 Functional Changes in Aging</td>
<td>2</td>
</tr>
<tr>
<td>PSYC 355 Adulthood and Aging</td>
<td>3</td>
</tr>
<tr>
<td>SOC 352 Aging and Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following: 9 credits

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**Chemical Dependency Minor**

Required (20 credits) including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT 410 Drugs Subject to Abuse</td>
<td>2</td>
</tr>
<tr>
<td>SOC 355 Drugs and Society</td>
<td>3</td>
</tr>
<tr>
<td>SWK 315 Substance Use and Abuse</td>
<td>2</td>
</tr>
</tbody>
</table>

Select four of the following: 12 credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUN 250 Dialogue on U.S. Diversity</td>
<td>1</td>
</tr>
<tr>
<td>COUN 529 Dynamics of Addiction</td>
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<tr>
<td>IS 311 Health and American Indian Cultures</td>
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<td>PSYC 360 Introduction to Personality</td>
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<tr>
<td>PSYC 270 Abnormal Psychology</td>
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<td>SOC 115 Social Problems</td>
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<tr>
<td>SOC 335 Families in a Changing Society</td>
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<tr>
<td>T&amp;L 350 Development and Education of the Adolescent</td>
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<tr>
<td>CJ 430 Developmental Perspectives on Adolescent Problem Behavior</td>
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<tr>
<td>PPT 499 Readings in Pharmacology, Physiology and Therapeutics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Total Credits | 20

With current approval of the student adviser and the minor coordinator up to three credit hours of departmental tutorial readings, special topics and/or research studies may be included.

**Courses**

**SWK 255. Introduction to Social Work. 4 Credits.**

An introduction to the social work profession including: the development of the profession, generalist practice, the problem solving process, the strengths perspective, social work values and ethics, levels of practice (individual, family, group, community and organization), and fields of practice; 40 hours of volunteer experience. F.S.

**SWK 257. Human Behavior and the Social Environment I. 3 Credits.**

Application of theories and knowledge from the liberal arts. Application of social work theory across the life span. An emphasis on social systems theory as the conceptual framework. Biopsychosocial-cultural aspects of human development. Prerequisites or Corequisites: PSYC 111 and SOC 110. F.S.

**SWK 311. Child Welfare. 3 Credits.**

Preparation for child welfare work. Child protection services, juvenile court procedures, day care services, the rights of children, foster homes and adoption. S.

**SWK 312. Social Work and the Legal Process. 2 Credits.**

Introduction to the legal system’s interaction with the human service delivery system. F.

**SWK 313. Orientation to Gerontology. 3 Credits.**

Introduction to gerontology including an overview of the field of gerontology, theories of aging, interdisciplinary teaming, demographics, and programs. F.

**SWK 315. Substance Use and Abuse. 2 Credits.**

Introduction to the dynamics of drug addiction and related issues, with special emphasis on alcohol. S.
SWK 316. Interprofessional Health Care. 1 Credit.
The focus of this course is on developing skills needed to work effectively
with an interprofessional health and mental health care team using a patient-
centered approach. Case studies are the primary teaching strategy. Students
enrolled include: social work, physical therapy, nursing, occupational therapy,
medicine, communication science disorders, clinical lab science, physician
assistant, and dietetics. Prerequisite: Admission in the BSSW Program. S/U
grading. F,S.

SWK 317. Social Work Research. 3 Credits.
Provides students with an understanding of basic qualitative and quantitative
research methods. In SWK 317, students also gain and apply skills related
to the critical evaluation of research. This course provides students with
foundational knowledge and skills necessary to understand and undertake
practice evaluation in practice courses, field placements, and in entry-level
practice settings. Prerequisite: Admission in the BSSW Program. Prerequisite
or Corequisite: Statistics. F,S.

SWK 318. Mental Health. 2 Credits.
Overview of the mental health service delivery system with a focus on case
management skills and the role of social work in the provision of mental health
services. F.

SWK 357. Human Behavior and the Social Environment II. 3 Credits.
Application of social work theory and research across the life span, with social
systems theory as the conceptual framework. Theories regarding development
of groups, communities and organizations. Prerequisite: Admission in the
BSSW Program. F,S.

SWK 397. Cooperative Education. 1-6 Credits.
Individually supervised experiences in a human service agency. Integrates
social work theory with practice. Contact the Cooperative Education Office.
Prerequisite: Consent of instructor. S/U grading. F,S,SS.

SWK 424. Generalist Social Work Practice with Individuals and Families. 3
Credits.
Generalist practice with individuals and families within the context of evidence-
based interventions. Develop skills to engage, assess, intervene, and evaluate
social work practice with individuals and families. Prerequisite: Admission in the
BSSW Program. F,S.

SWK 434. Generalist Social Work Practice with Task and Treatment
Groups. 3 Credits.
Generalist practice with task and treatment groups within the context of evidence-based interventions. Develop skills to engage, assess, plan,
intervene, and evaluate social work practice with groups. Prerequisite:
Admission to the BSSW program. Prerequisite or Corequisite: SWK 357. F,S.

SWK 442. Social Policy. 3 Credits.
Provides knowledge of social policy, and develops critical analysis skills to
advance social and economic well-being and understanding of the interaction
between research, practice and policy. Prerequisite: Admission in the BSSW
Program. F,S.

SWK 454. Generalist Social Work Practice with Communities and
Organizations. 3 Credits.
Generalist practice with organizations and communities within the context of
evidence-based interventions. Develop skills to engage, assess, intervene, and
evaluate social work practice with communities and organizations. Prerequisite:
Admission to the BSSW program. Prerequisite or Corequisite: SWK 357. F.S.

SWK 481. Field Education I. 5 Credits.
Provides learning opportunities in generalist social work practice emphasizing
the core competencies and demonstration of practice behaviors. Connect
the theoretical and conceptual contributions of the classroom with the
F,S,SS.

SWK 482. Field Education Seminar I. 1 Credit.
Integrates classroom content with actual practice. Corequisite: SWK 481.
F,S,SS.

SWK 483. Field Education II. 5 Credits.
Provides learning opportunities in generalist social work practice emphasizing
the core competencies and demonstration of practice behaviors. Connect
the theoretical and conceptual contributions of the classroom with the
practical world of the internship setting. Corequisite: SWK 484. Prerequisite or
Corequisite: SWK 481. S/U grading. F,S,SS.

SWK 484. Field Education Seminar II. 1 Credit.
Integrates classroom content with actual practice. Corequisite: SWK 483.
F,S,SS.

SWK 489. Senior Honors Thesis. 1-3 Credits.
Supervised independent study culminating in a thesis. Repeatable to a
maximum 6 credits. Repeatable to 6 credits. F,S.

SWK 493A. Special Topics. 1-3 Credits.
Individualy or group supervised research or interdepartmental studies and
seminars in social work related areas. Repeatable to a maximum 9 credits.
Regular grading. Prerequisite: SWK 255 or consent of instructor. Repeatable to
9 credits. F,S,SS.

SWK 493B. Special Topics. 1-3 Credits.
Individually or group supervised research or interdepartmental studies and
seminars in social work related areas. Repeatable to a maximum 9 credits. S-U
grading. Repeatable to 9 credits. S/U grading. F,S,SS.

Sociology (Soc)
http://www.arts-sciences.und.edu/sociology
Berg, Legerski, Minnotte, Pedersen, Staples, Stofferahn (Chair), and White
This department offers a major and minor in sociology. In addition, there
is a graduate program leading to the M.A. The undergraduate programs in
sociology are outlined below.

Graduate seminars, reading courses, and courses with eight or nine as the
last digit may be repeated for credit at the discretion of the department. Some
sociology background is usually necessary for upper level courses even when
no specific prerequisite is listed.

College of Arts and Sciences

B.A. with a Major in Sociology

Required 125 credits (36 of which must be numbered 300 or above, and 60 of
which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The following Curriculum:

33 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>SOC 301</td>
<td>Basic Sociological Theory</td>
<td>3</td>
</tr>
<tr>
<td>SOC 323</td>
<td>Sociological Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
<td>3</td>
</tr>
<tr>
<td>SOC 475</td>
<td>Sociology Capstone</td>
<td>3</td>
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<tr>
<td></td>
<td>Additional credits numbered 400 and above</td>
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<tr>
<td>Electives in Sociology</td>
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Total Credits 33

Minor in Sociology

Required 22 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 301</td>
<td>Basic Sociological Theory</td>
<td>3</td>
</tr>
<tr>
<td>SOC 323</td>
<td>Sociological Research Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Courses numbered 300 and above</td>
<td>9</td>
</tr>
</tbody>
</table>
**Courses**

**SOC 110. Introduction to Sociology. 3 Credits.**
A systematic examination of the social components of human behavior, including the norms, laws, cultural patterns, and economic forces that organize everyday life. Students will analyze theories of society, the structure of social institutions, social conflict and stratification, as well as social interactions among diverse groups of people. F,S,SS.

**SOC 115. Social Problems. 3 Credits.**
A sociological analysis of major social problems in America. F,S.

**SOC 250. Diversity in American Society. 3 Credits.**
Students will explore diverse American identities through the intersections of race, ethnicity, gender, social class, sexual orientation, age, and disability status. Theories of intergroup relations, prejudice and discrimination are covered. S.

**SOC 252. Criminology. 3 Credits.**
This course provides an in-depth investigation into the major criminological theories that explain the causation, occurrence and development of criminal behavior. Crime typologies and the social correlates of crime and victimization are discussed. Provides an explanation of the methods criminologists use to study crime trends and criminal patterns of behavior. F,S.

**SOC 253. Delinquency and Juvenile Justice. 3 Credits.**
This course focuses on theoretical explanations for the causes, dynamics, and consequences of juvenile delinquency. Students will explore a justice system specifically designed to handle American youth and will be introduced to basic terminology relating to juvenile delinquency and the juvenile justice system. F,S.

**SOC 301. Basic Sociological Theory. 3 Credits.**
A survey of the main trends in the history of sociological thought. Basic concepts and frames of reference central to sociological theory and analysis are emphasized. F,S.

**SOC 306. Social Change and Social Movements. 3 Credits.**
The focus of this course is on social change in American society in the context of current environmental and social problems. Topics include definitions of social change, patterns and causes of social change, theoretical explanations for social change, contemporary social movements and the theoretical explanation for their origins and planned social change strategies. On demand.

**SOC 309. Selected Topics. 1-4 Credits.**
Selected topics in sociology taught at the junior level. Repeatable to 40 credits with different topics. Repeatable to 40 credits. On demand.

**SOC 323. Sociological Research Methods. 3 Credits.**
This course explores various facets of the sociological research process. The main focus is on the design and implementation of quantitative research, with attention also given to other types of research, including qualitative research and content analysis. F,S.

**SOC 326. Sociological Statistics. 3 Credits.**
This course introduces students to calculation and application of basic statistical techniques employed by sociologists. Students perform statistical analyses of real data sets using SPSS software. Prerequisite: MATH 93 or any higher mathematics course. F,S.

**SOC 331. Community Sociology. 3 Credits.**
This course addresses one of the most fundamental concepts in human relationships: community. What is community? How is community related to the physical environment and place? Who defines community? These are some of the core questions of both urban and rural sociology that we will address in this course. On demand.

**SOC 333. Families in a Changing Society. 3 Credits.**
An exploration of how family forms, norms, and theories have changed over time; the social forces that influence families at each of the major life stages (such as courtship, marriage, parenthood, old age); how statuses such as race, class, gender, and sexuality influence a person's opportunities for family formation and experiences within families; and the social policies that help or hinder family functioning. F.

**SOC 340. Sociology of Gender. 3 Credits.**
This course is a sociological exploration of how gender dynamics have changed across time and vary globally. How gender creates barriers and opportunities - for both men and women - across multiple facets of social life is emphasized. S.

**SOC 352. Aging and Society. 3 Credits.**
An introduction to the multidisciplinary study of aging as a lifelong process. Biological, psychological, and sociological theories are reviewed to understand human development over the life course, including the transitions of marriage, work, retirement, and death. Demographic and social structural influences are also discussed in order to examine the effect of an aging population on society. S.

**SOC 354. Medical Sociology. 3 Credits.**
An examination of the social contexts of health and health care, including the political, economic, and environmental circumstances that shape illness and access to care. This includes a focus on medical institutions as social systems affected by social movements and social change, as well as the social forces that shape patient-provider interactions and the quality of care received. Implications for public policy and practice are considered. On demand.

**SOC 355. Drugs and Society. 3 Credits.**
Social factors affecting use and control of self-administered psychoactive drugs, including alcohol, cigarettes, marijuana and more illicit substances. Topics include social definitions, causes, controls and consequences of drug problems. S.

**SOC 361. Social Psychology. 3 Credits.**
The study of individual behavior in its social context: how the individual acts upon the social environment, is acted upon by the environment, and interacts with other individuals. S.

**SOC 397. Cooperative Education. 1-6 Credits.**
A practical work experience with an employer closely associated with student's academic area. Repeatable to 12 credits. Repeatable to 12 credits. S/U grading. F,S,SS.

**SOC 400. Internship in Sociology. 1-5 Credits.**
A learning experience in a selected community agency or organization determined by the student's area of interest. The student will select a Sociology professor to oversee the internship, and it is with this professor that the student will complete a contract for the course prior to enrolling. Fieldwork is under the supervision of agency personnel. Two to three hours per week are required in the field per credit hour for each week of the semester. Prerequisite: Instructor approval. Repeatable to 5 credits. S/U grading. F,S.

**SOC 407. Political Sociology. 3 Credits.**
Sociological analysis of political and parapolitical groups; voting behavior; political socialization process; power elites, societies and systems of government; power structures. On demand.

**SOC 409. Selected Topics in Sociology. 3 Credits.**
Topics in sociology taught at the senior level. Repeatable to 6 credits with different topics. Repeatable to 6 credits. On demand.

**SOC 411. Workplace Dynamics. 3 Credits.**
This course focuses on understanding contemporary workplace dynamics, informed by how the organization of work has changed across time. Theories underlying the organization of work are examined, with an emphasis on how workplaces are shaped by larger social forces, how they shape society, and how they intersect with other organizations. The course concludes with an exploration of diversity in the workforce, especially the ramifications of social class, gender, and race/ethnicity in organizational settings. On demand.

**SOC 435. Racial and Ethnic Relations. 3 Credits.**
A survey of major USA racial and ethnic groups, the histories of their social opportunities - for both men and women - across multiple facets of social life is emphasized. S.

**SOC 436. Social Inequality. 3 Credits.**

**SOC 437. Population. 3 Credits.**
A basic consideration of formal and social demography. The determinants and consequences of population change. On demand.
SOC 450. Deviant Behavior. 3 Credits.
This course examines the nature, types and societal reactions to deviant behavior; special emphasis on the process of social typing, regulation of deviance, deviant subcultures, and identities. On demand.

SOC 475. Sociology Capstone. 3 Credits.
This course is a culminating experience for Sociology majors. Building on work in the major, students write an empirical research paper and present their findings to the Department. Prerequisites: SOC 110, SOC 301, SOC 323, SOC 326 and second semester junior standing. F.S.

SOC 489. Senior Honors Thesis. 1-15 Credits.
Supervised independent study culminating in a thesis. Total not to exceed fifteen credits. Prerequisite: Consent of department and approval of the Honors Committee. F.S.

SOC 492. Research Experience in Sociology. 1-5 Credits.
Students enrolled in this practicum work on a research project under the direction of one or more faculty. The practicum is designed to provide hands-on research and/or statistical experience for those enrolled. Repeatable for a maximum of 10 credits. Repeatable to 10 credits. S/U grading. F.S.

SOC 494. Readings in Sociology. 1-5 Credits.
Designed for students who want instruction in subjects not covered adequately in usual course offerings. Specific arrangements must be made with the instructor prior to registration. Prerequisite: Consent of instructor. Repeatable to 10 credits. F.S.

Space Studies (SpSt)

http://www.space.edu/

Casler (Chair), de Leon, Dodge, Fevig, Gaffey, Hardsen, Rygalov, and Seelan

A minor in Space Studies is available to introduce students to the research, development, and operation of a wide array of space ventures. The multi-disciplinary nature of space activity immediately becomes evident, allowing the student to correlate the space experience with areas in a major field of study. Political, legal, and scientific aspects are dealt with extensively, and key technologies are introduced.

John D. Odegard School of Aerospace Sciences

Minor in Space Studies

Required 20 credits, including:

SPST 200 Introduction to Space Studies 3

Remaining credits from:

SPST 220 Space Science and Exploration 3
SPST 270 History of the Space Age 3
SPST 300 The Case for Space 3
SPST 310 Introduction to Dinosaurs 3
SPST 360 NASA 3
SPST 405 Space Mission Design 3
SPST 410 Life Support Systems 3
SPST 425 Observational Astronomy 3
SPST 430 Earth System Science 3
SPST 435 Global Change 3
SPST 450 International Space Programs 3
SPST 460 Life in the Universe 3
SPST 470 Special Topics in Space Studies 1-3
SPST 480 Readings in Space Studies 1-3
SPST 491 Independent Study 2

Up to a maximum of 6 credits may also be obtained from the following:

AVIT 403 Aerospace Law 3
GEOG 374 Environmental Remote Sensing & 374L and Environmental Remote Sensing Laboratory 3
GEOG 475 Digital Image Processing 3
PHYS 460 Introduction to Astrophysics 3

PHYS 461 Introduction to Astrophysics II 3

Total Available Credits 58-62

Courses

SPST 200. Introduction to Space Studies. 3 Credits.
An introduction to a range of topics in space studies including: an overview of planetary science, stellar evolution and the history of the universe; a brief view of the history of national and international activities, an examination of the fundamentals of space flight and human activity in space, a review of some current problems and issues in the space arena, and a projection of the future course of space activities in the coming decades. This is a required course for an undergraduate minor in space studies. F.S.

SPST 220. Space Science and Exploration. 3 Credits.
 Revolutionary advances that have occurred in astronomy, the earth sciences and planetary science as a result of our entry into space. This course surveys the manned and robotic space missions which have gathered data for this new view of the Universe. The course introduces current concepts in cosmological theory as well as an overview of planetary evolution, solar system dynamical processes and physical characteristics of the planets. Prerequisite: SPST 200. S.

SPST 270. History of the Space Age. 3 Credits.
This course introduces students to the history of human endeavors in space. These include the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spaceflight. Prerequisite: SPST 200 or HIST 102 or HIST 104. F.

SPST 300. The Case for Space. 3 Credits.
This is a multidisciplinary course that will examine the rationales for a wide variety of space exploration and development activities. Topics will include human space flight, space science missions, military and commercial space activities, space resource utilization, and the benefits and problems that society derives from these activities. The socioeconomic, socio-political and multi-cultural impact of space activities--nationally and globally--will be discussed and debated with the goal of providing students with a broad perspective of the varying effects of space activities on modern society. Prerequisite: SPST 200. F., even years.

SPST 310. Introduction to Dinosaurs. 3 Credits.
This course provides a broad introduction to dinosaurs and an examination of the extra-terrestrial influence that appears to have led to their extinction, and which thus redirected the evolution of life on Earth. Each of the major dinosaur groups (theropods such as T. rex, sauropods such as Brontosaurus (Apatosaurus), duckbills, armored dinosaurs such as Stegosaurus, horned dinosaurs such as Triceratops, etc.) is examined as well as their cousins in the air (pterosaurs) and sea (ichthyosaurs pliosaurs). The course reviews our current models of their origin, evolution, lifestyles, diet, reproductive behavior, and physiology. We examine the data and reasoning that leads to and updates these models. The course also places the dinosaurs in the context of Earth as a geologically evolving planet. The various theories for the dinosaur extinction will be outlined and evaluated. Learning tools include videos (both scientific and popular), dinosaur fossils, and scale models. On demand.

SPST 360. NASA. 3 Credits.
An examination of the National Aeronautics and Space Administration (NASA). NASA was formed in 1958 out of the existing National Advisory Committee on Aeronautics (NACA) and elements from the Army and Navy -- but not the Air Force -- space programs. This course will examine the technologies, the history and the politics involved in each of the NASA elements -- including the one “new” center not inherited from earlier organizations: the Johnson Space Center in Houston. The course will conclude with a picture of NASA today. Prerequisite: SPST 200 or consent of instructor. F.

SPST 405. Space Mission Design. 3 Credits.
A team design project to develop the requirements for a space mission. The specific mission will vary from time to time. Design teams will work on selected portions of the mission. Accompanying lectures will provide background material. Prerequisite: SPST 200. S.

SPST 410. Life Support Systems. 3 Credits.
A review of the physiological effects of living in space including a discussion of current and near-term life support systems equipment for the provision of oxygen, water, food, and radiation protection. In addition, a review will be made of the issues associated with the development of fully closed ecological life-support systems that will be essential to the long-term development of space. Prerequisite: SPST 200. On demand.
SPST 425. Observational Astronomy. 3 Credits.
This course provides an introduction to observational astronomy and includes three segments: basic observing techniques and astronomical equipment (telescopes, CCDs); visual observing and the characteristics of the night sky; astrometric and photometric observing, data reduction, and interpretations; and image processing and color imaging techniques. Students will learn to operate a remotely controllable Internet telescope and CCD camera. A broadband Internet connection is recommended. Night observing is required. Course fee. Prerequisite: PHYS 110. On demand.

SPST 430. Earth System Science. 3 Credits.
This course begins with a review of the physical sciences of geology, meteorology and oceanography to examine the coupled interactions between the land, atmosphere and oceans. Particular emphasis is placed on remote sensing techniques for global monitoring of biogeochemical processes. The role of human activities on Earth processes and the consequences of global environmental changes are discussed. The growing use of space-based data sets and the implications of Earth Observing System technologies, including research goals and hardware requirements, are examined. Prerequisite: SPST 200. On demand.

SPST 435. Global Change. 3 Credits.
The current human population represents something unprecedented in the history of the world. Never before has one species had such a great impact on the environment in such a short time and continued to increase at such a rapid rate. Human activities are therefore significantly influencing the Earth’s environment in many ways in addition to greenhouse gas emissions and climate change. Anthropogenic changes to Earth’s land surfaces, oceans, coasts, and atmosphere and to biological diversity, the water cycle and biogeochemical cycles are clearly identifiable beyond natural variability. This course investigates many facets of the global change issues, and attempts to provide an up-to-date introduction to the study of the Earth’s environment. F, even years.

SPST 450. International Space Programs. 3 Credits.
This course will introduce students to the major governmental space programs around the world. The history, activities and future directions of the Russian/Soviet, European/ESA, Chinese, Japanese, Indian and other space programs will be explored. International collaborations between the various programs will also be studied. Prerequisite: SPST 200. On demand.

SPST 460. Life in the Universe. 3 Credits.
This course examines the nature and evolution of life on Earth from its origin to the present time in the context of cosmological evolution, chemical evolution, planetary evolution, biological evolution, and cultural evolution. The possibility of life elsewhere in the universe is considered based on the conditions under which life could arise and flourish. Human changes to the Earth are placed within this context. The future of life on Earth is discussed and the social and cultural implications arising from the discovery of extraterrestrial life are explored. On demand.

SPST 470. Special Topics in Space Studies. 1-3 Credits.
Lecture, discussion and readings on specific topics of current interest. May be repeated for credit if topic is different up to a total of 6 credits. Prerequisite: SPST 200. Repeatable to 6 credits. On demand.

SPST 480. Readings in Space Studies. 1-3 Credits.
Directed student readings designed to develop advanced knowledge in a specific area. A written report is required. May be repeated for a total of six credits. Prerequisite: SPST 200 or consent of instructor. Repeatable to 6 credits. F,S,SS.

SPST 491. Independent Study. 2 Credits.
An independent study project culminating in a paper on an approved topic in Space Studies. Requires regular meetings with the instructor. Prerequisites: SPST 200, senior standing, 15 hours of Space Studies, and consent of instructor. F,S,SS.

Sports Medicine
http://www.med.unl.edu/sports-medicine

Westeneng (Chair), Bjerke, Carlson, Champagne, Degerstrom, Greek, Mann, Nunez, Ogino, Poolman, Rambough, Thompson, Tsuchiya, Vanderpan, and Ziegler

The Department of Sports Medicine offers the Bachelor of Science in Athletic Training degree under the auspices of the UND School of Medicine and Health Sciences. Prior to the fall of 2015, the Department of Sports Medicine was the Division of Sports Medicine and was within the Department of Family and Community Medicine (FMed). Classes will continue to be labeled “FMed” until a change is approved by the University Curriculum Committee.

The degree program entails a four-year curriculum designed to prepare the student for an entry-level position in the field of athletic training. Athletic trainers are health care professionals who collaborate with physicians to provide preventative services, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. Upon completion of the curriculum, the student will be eligible to take the Board of Certification, Inc. examination and become a Certified Athletic Trainer. The athletic training degree program is accredited by the Commission on Accreditation of Athletic Training Education (CAATE).

Admission to the curriculum is competitive. Students are selected using the following criteria: academic performance (2.75 GPA minimum), departmental application, references, interview, 100 hours of directed observation, and completion of:

- SMED 101 Orientation to Athletic Training 1
- SMED 207 Prevention and Care of Athletic Injuries 2
- SMED 207L Laboratory Prevention and Care of Athletic Injuries 1
- BIOL 150 General Biology I 3
- BIOL 150L General Biology I Laboratory 1
- KIN 110 First Aid and CPR 1

It is recommended that students applying for this program meet with the academic coordinator early in their freshman year.

School of Medicine

B.S. in Athletic Training

Required 127 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. The following curriculum:

Pre-Admission Courses

The student must earn a letter grade of C or better in the following courses to be admitted in the program.

- BIOL 150 General Biology I
- BIOL 150L General Biology I Laboratory

The student must earn a letter grade of B or better in the following courses to be admitted in the program.

- SMED 101 Orientation to Athletic Training 1
- SMED 207 Prevention and Care of Athletic Injuries 2
- SMED 207L Laboratory Prevention and Care of Athletic Injuries 1

At the time of application to the Athletic Training Program, the student must have completed or be enrolled in all of the above courses. In addition, the student must show proof of First Aid and CPR certifications or enrollment in:

- KIN 110 First Aid and CPR 1

Core Courses

The following core courses are required for the B.S. in Athletic Training:

- CHEM 121 General Chemistry I
- CHEM 121L General Chemistry I Laboratory
- COMM 110 Fundamentals of Public Speaking
- ENGL 110 College Composition I
- ENGL 130 Composition II: Writing for Public Audiences
- MED 205 Medical Terminology
- PHYS 161 Introductory College Physics I (includes lab)
- PHYS 162 Introductory College Physics II (includes lab)
### Professional Courses

The following professional courses are required for the B.S. in Athletic Training:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>SMED 205</td>
<td>Anatomy for Athletic Trainers</td>
<td>2</td>
</tr>
<tr>
<td>SMED 208</td>
<td>Procedures in Athletic Training</td>
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<tr>
<td>SMED 208L</td>
<td>Laboratory Procedures in Athletic Training</td>
<td>1</td>
</tr>
<tr>
<td>SMED 200</td>
<td>Understanding Medicine</td>
<td>3</td>
</tr>
<tr>
<td>SMED 211</td>
<td>Beginning Clinical Practicum I in Athletic Training</td>
<td>1</td>
</tr>
<tr>
<td>SMED 213</td>
<td>Beginning Clinical Practicum in Athletic Training</td>
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</tr>
<tr>
<td>SMED 311</td>
<td>Intermediate Clinical Practicum I in Athletic Training</td>
<td>2</td>
</tr>
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<td>SMED 312</td>
<td>Medical Aspects of Sports</td>
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<tr>
<td>SMED 313</td>
<td>Intermediate Clinical Practicum II in Athletic Training</td>
<td>2</td>
</tr>
<tr>
<td>SMED 320</td>
<td>Athletic Training Modalities</td>
<td>2</td>
</tr>
<tr>
<td>SMED 320L</td>
<td>Laboratory Athletic Training Modalities</td>
<td>1</td>
</tr>
<tr>
<td>SMED 321</td>
<td>Athletic Training Rehabilitation Techniques</td>
<td>2</td>
</tr>
<tr>
<td>SMED 321L</td>
<td>Laboratory Athletic Injury Rehabilitation Techniques</td>
<td>1</td>
</tr>
<tr>
<td>SMED 325</td>
<td>Pharmacology in Sport</td>
<td>2</td>
</tr>
<tr>
<td>SMED 343</td>
<td>Organizational Administration of Athletic Training</td>
<td>3</td>
</tr>
<tr>
<td>SMED 411</td>
<td>Advanced Clinical Practicum I in Athletic Training</td>
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</tr>
<tr>
<td>SMED 413</td>
<td>Advanced Clinical Practicum II in Athletic Training</td>
<td>2</td>
</tr>
<tr>
<td>SMED 481</td>
<td>Athletic Injury Assessment</td>
<td>4</td>
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<tr>
<td>SMED 490</td>
<td>Learning of Systems in Athletic Training</td>
<td>3</td>
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<tr>
<td>SMED 491</td>
<td>Seminar in Athletic Training</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 240</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>KIN 332</td>
<td>Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402</td>
<td>Exercise Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
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### Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>Orientation to Athletic Training</td>
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<tr>
<td>SMED 200</td>
<td>Understanding Medicine</td>
<td>3</td>
</tr>
<tr>
<td>SMED 205</td>
<td>Anatomy for Athletic Trainers</td>
<td>2</td>
</tr>
<tr>
<td>SMED 208</td>
<td>Procedures in Athletic Training</td>
<td>1</td>
</tr>
<tr>
<td>SMED 208L</td>
<td>Laboratory Procedures in Athletic Training</td>
<td>1</td>
</tr>
<tr>
<td>SMED 200</td>
<td>Understanding Medicine</td>
<td>3</td>
</tr>
<tr>
<td>SMED 211</td>
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<td>SMED 213</td>
<td>Beginning Clinical Practicum in Athletic Training</td>
<td>1</td>
</tr>
<tr>
<td>SMED 311</td>
<td>Intermediate Clinical Practicum I in Athletic Training</td>
<td>2</td>
</tr>
<tr>
<td>SMED 312</td>
<td>Medical Aspects of Sports</td>
<td>2</td>
</tr>
<tr>
<td>SMED 313</td>
<td>Intermediate Clinical Practicum II in Athletic Training</td>
<td>2</td>
</tr>
<tr>
<td>SMED 320</td>
<td>Athletic Training Modalities</td>
<td>2</td>
</tr>
<tr>
<td>SMED 320L</td>
<td>Laboratory Athletic Training Modalities</td>
<td>1</td>
</tr>
<tr>
<td>SMED 321</td>
<td>Athletic Training Rehabilitation Techniques</td>
<td>2</td>
</tr>
<tr>
<td>SMED 321L</td>
<td>Laboratory Athletic Injury Rehabilitation Techniques</td>
<td>1</td>
</tr>
<tr>
<td>SMED 325</td>
<td>Pharmacology in Sport</td>
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<tr>
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<td>SMED 413</td>
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</tr>
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<td>SMED 481</td>
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</tr>
<tr>
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<td>Fundamentals of Nutrition</td>
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<td>Exercise Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
</tbody>
</table>

SMED 211. Beginning Clinical Practicum I in Athletic Training. 1 Credit.
A clinical course designed to allow the student to develop specified clinical competencies in a directed, progressive manner. Prerequisites: SMED 101, SMED 207 and SMED 207L. Corequisite: SMED 208 and SMED 208L. F.

SMED 213. Beginning Clinical Practicum in Athletic Training. 1 Credit.
A course designed to allow the student to develop specified clinical competencies in a directed, progressive manner. Prerequisites: SMED 208 and SMED 208L. S.

SMED 311. Intermediate Clinical Practicum I in Athletic Training. 2 Credits.
A course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisites: SMED 208. S.

SMED 232. Medical Aspects of Sports. 2 Credits.
A course designed to introduce students to various medical specialities and medical problems and their effects on athletic participation. Prerequisite: Permission of instructor. F.

SMED 313. Intermediate Clinical Practicum II in Athletic Training. 2 Credits.
A course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisites: SMED 481. Corequisite: SMED 320, SMED 321 and SMED 321L. S.

SMED 320. Athletic Training Modalities. 2 Credits.
A course designed to present the theoretical and applied principles and techniques for the application of modalities in sports injury care. Prerequisite: SMED 481. S.

SMED 320L. Laboratory Athletic Training Modalities. 1 Credit.
A course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisites: SMED 481. Corequisite: SMED 302. S.

SMED 321. Athletic Training Rehabilitation Techniques. 2 Credits.
A course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisites: SMED 481. Corequisite: SMED 321L. S.

SMED 321L. Laboratory Athletic Injury Rehabilitation Techniques. 1 Credit.
A course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisite: SMED 481. Corequisite: SMED 321L. S.

SMED 325. Pharmacology in Sport. 2 Credits.
This course is designed to teach students the theories and principles of Pharmacology as it relates to Athletic Training. S.

SMED 343. Organizational Administration of Athletic Training. 3 Credits.
A course designed to acquaint students with the theories and principles of administration. Administrative functions as they relate to the athletic trainer will be explained. Prerequisite: Senior standing or consent of instructor. S.

SMED 411. Advanced Clinical Practicum I in Athletic Training. 2 Credits.
A clinical course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisite: SMED 313. F.

SMED 413. Advanced Clinical Practicum II in Athletic Training. 2 Credits.
A clinical course designed to allow the student to develop specified clinical competencies in a directed progressive manner. Prerequisite: SMED 313. S.

SMED 481. Athletic Injury Assessment. 4 Credits.
A course designed to instruct the student in the theories and skills of injury evaluation. Prerequisite: SMED 213. F.

SMED 491. Seminar in Athletic Training. 2 Credits.
Advanced work in athletic training to include surgical and conservative injury management, rehabilitation and injury. Repeatable to 4 credits. Prerequisite: Permission of instructor. Repeatable to 4 credits. F.S.

SMED 494. Directed Studies in Athletic Training. 1-4 Credits.
An in-depth study in a subject area selected by the student under tutorial supervision. Repeatable to 6 credits. Prerequisite: Instructor approval. Repeatable to 6 credits. F.S.SS.

SMED 497. Internship in Athletic Training. 3 Credits.
An off campus athletic training experience designed to expose the student to alternate concepts of care. Repeatable up to 6 credits with instructor permission. Prerequisite: SMED 313. Repeatable to 6 credits. On demand.
Licensing requirements for teachers are impacted by changes at the federal and state level. The following program descriptions are subject to change as new rules and regulations are implemented. It is imperative that all prospective and admitted students to teacher education maintain close and regular contact with their faculty advisors in order to ensure efficient progress toward their degrees.

The University of North Dakota has offered teacher education programs since its founding in 1883. The Department of Teaching and Learning is a comprehensive, accredited, undergraduate and graduate department of education. It supports a broad view of education and seeks to serve preserve and inservice teachers and other education personnel with intensive, intellectually challenging, integrated study.

The Department strives to model the kind of educational environment it is promoting in early childhood settings, elementary schools, middle schools and secondary schools. Students are encouraged to assume initiative and independence in their learning while developing personal and professional commitments and competence. To help meet this expectation, programs in the Department provide for personalized learning. The Department is particularly committed to active community participation in the formation of goals and policy at all levels of education, including Native American communities in their efforts to improve education and to classroom teachers committed to continuing their personal and professional learning.

Teacher education programs at the University of North Dakota are approved by the State of North Dakota Education Standards and Practice Board (ESPB) and accredited by the National Council for the Accreditation of Teacher Education (NCATE) and are in compliance with Title II, Higher Education Act reporting procedures. The University is accredited by the North Central Association.

### Degree Programs

The Department offers degree programs at the undergraduate level in the preparation of early childhood, elementary, middle and secondary school teachers. Students studying elementary education are also able to pursue specialized study resulting in a double major in early childhood education or middle level education. Candidates interested in teaching at the secondary level pursue concentrated studies in the disciplines in which they desire to teach in addition to the professional education sequence leading to licensure. The Bachelor of Science in Education or the Bachelor of Science in Arts are all degree options, depending upon the field of study. At the present time, the following licensure areas are available:

- Art (Visual Arts)
- Biology
- Chemistry
- Chinese
- English
- Fisheries and Wildlife Biology
- French
- Geography
- Geology/Earth Science
- German
- Greek
- History
- Latin
- Mathematics
- Physics
- Science
- Social Studies

### Student Teaching Requirements

Acceptance for student teaching requires that candidates in all majors, which include Early Childhood Education, Elementary Education, and in Middle Level Education have a minimum cumulative GPA of 3.0 in Teaching and Learning coursework, satisfactorily complete a field experience, present a minimum overall GPA of 2.75 based on at least 76 credit hours of work, and are recommended by the faculty in their area(s) of student teaching.

Admission to student teaching in Secondary Education and K-12 programs (Music, and Physical Education) requires that the candidates have completed or are enrolled in all courses of the major and the professional education programs, have an overall GPA of at least 2.75, have a minimum GPA of 2.75 in the content major completed at the time of application, have a minimum GPA of 3.0 in Teaching and Learning coursework, and are recommended by the Teaching and Learning faculty and the student’s advisor(s). In addition, candidates in all majors must take the appropriate Praxis II exams prior to student teaching.

- B.S. ED. with Major in Elementary Education (p. )
- B.S.ED. with Major in Science (p. )
- B.S.ED. with Composite Major in Social Studies (p. )

## B.S. ED. with Major in Early Childhood Education

Required 125 credits (36 of which must be numbered 300 or above, and 60 which must be from a 4-year institution). Please see an Early Childhood academic adviser for the most accurate program planning.

I. Essential Studies Graduation Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

A. Students admitted Fall 2008 and after are required to take the following:

### Communications — 9 credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

### Social Sciences — 9 credits

From 2 departments, including T&L 252 Child Development (required)

### Arts and Humanities — 9 credits

From 2 departments, including FA 150 Introduction to the Fine Arts (required)

### Math, Science, Technology — 9 credits

Must be taken in at least 3 departments, must include 2 science courses with corresponding labs.

III. The following Early Childhood Education curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 310</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 311</td>
<td>Observing and Assessing Children</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 313</td>
<td>Language Development and Emerging Literacy</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of Exceptional Students</td>
<td>3</td>
</tr>
</tbody>
</table>
B.S. ED. with Major in Elementary Education

Required 125 credits (36 of which must be numbered 300 or above, and 60 which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

III. The Following Curriculum:

T&L 252 Child Development 3
or PSYC 250 Developmental Psychology 3
FA 150 Introduction to the Fine Arts 3
GEOG 151 Human Geography 3
or GEOG 161 World Regional Geography 3

Select one of the following (History): 3

HIST 101 Western Civilization I
HIST 102 Western Civilization II
HIST 103 United States to 1877
HIST 220 History of North Dakota

MATH 103 College Algebra 3

Total Credits 15

* A higher level math or quality score on the math placement test may be substituted.

A. Science Requirement:

Two sciences with corresponding labs

Additionally, students must take a science course in the following four science areas: physical, biological, earth, and space studies. This coursework may be selected from the Essential Studies course list or from T&L 400-level science courses. Note that T&L science courses count as elective courses in the major and cannot be applied towards Essential Studies graduation requirements.

IV. Minor or Specialty Area:

Each student must have a minor or specialty area consisting of 20 credits. Two courses or a maximum of six credits may be transferred from your Essential Studies to your minor or specialty area. Select from: Anthropology, Art, English, Language Learner/Bilingual Education, Early Childhood Education, Economics, English, Fine Arts, Foreign Language, Geography, History, Indian Studies, Kindergarten Education, Literacy Education, Mathematics, Middle School, Music, Physical Education, Political Science, Psychology, Science, Social Studies, Sociology, Special Education, Technology Education or Visual Arts.

V. Introductory Courses:

T&L 250 Introduction to Education 3
T&L 315 Education of Exceptional Students 3

Total Credits 6

VI. Post Admission Courses:

MATH 277 Mathematics for Elementary School Teachers 3

Select one of the following: 3

T&L 328 Survey of Children’s Literature 3
or T&L 329 Young Adult Literature 3
T&L 335 Understanding Readers and Writers 3
T&L 339 Technology for Teachers 2
ART 460 Methods, Materials and Philosophy: Art in the Elementary Classroom 3
MUSC 442 Music for Elementary School Teachers 3
or MUSC 443 Music Methods and Materials for Elementary School Teachers 3
or MUSC 449 Music Education Special Topics 3
KIN 305 Health/Physical Education for Early Childhood and Elementary Education Teachers 3
T&L 432 Learning Environments 3
T&L 433 Multicultural Education 3
T&L 417 Writing & Language Arts Methods 2

Total Credits 28

VII. Education Methods Courses:

TEAM (Taken as a block of courses):

T&L 410 Teaching Reading in the Elementary School Classroom (TEAM) 3
T&L 430 Social Studies in the Elementary School (Team) 3
T&L 440 Mathematics in Elementary School (Team) 3
T&L 470 Science in the Elementary School (TEAM) 3
T&L 486 Field Experience 2
T&L 487 Student Teaching 13
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3

Total Credits 14

VIII. Student Teaching and Related Courses:

T&L 487 Student Teaching 13
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3

English Language Learner or Bilingual Education Endorsement

Students who complete the courses listed below will be eligible for North Dakota endorsement in English Language Learner (ELL) or Bilingual Education. Students must be certified to teach in Elementary, Middle Level or Secondary classrooms.

T&L 415 Language and Literacy Development of English Language Learners 3
T&L 433 Multicultural Education 3
T&L 486 Field Experience 14
ENGL 209 Introduction to Linguistics 3
The bilingual education endorsement requires proficiency in the language of instruction. These requirements may be impacted by change at the federal and state level.

**B.S.ED. with Double Major in Elementary Education and a Major in Early Childhood**

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Graduation Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

III. Elementary Education Curriculum as listed above.

IV. The following Early Childhood Education Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
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<tr>
<td>T&amp;L 286</td>
<td>Field Experience</td>
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<tr>
<td>T&amp;L 310</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 311</td>
<td>Observing and Assessing Children</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 313</td>
<td>Language Development and Emerging Literacy</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 320</td>
<td>Infant and Toddler</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 322</td>
<td>Administration and Leadership in Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 333</td>
<td>Methods and Materials: Pre-Kindergarten</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 336</td>
<td>Social and Emotional Development and Guidance of Children</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 338</td>
<td>Home, School and Community Relations</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 443</td>
<td>Mathematics for Primary Grades</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 453</td>
<td>Methods and Materials: Kindergarten</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 456</td>
<td>Early Childhood Ed Seminar</td>
<td>1</td>
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<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>13</td>
</tr>
<tr>
<td>T&amp;L 489</td>
<td>Senior Capstone: Responsive Teaching</td>
<td>3</td>
</tr>
</tbody>
</table>

One elective course which deals with communication with adults, to be selected with adviser approval.

Total credits 37-39.

These requirements may be impacted by change at the federal and state level.

**Kindergarten Endorsement**

Undergraduate students who wish a Kindergarten Endorsement but do not wish to complete the double major in elementary and early childhood education must take the following courses as part of 15 hours of required kindergarten coursework. In addition, they are required to student teach in a kindergarten classroom.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 310</td>
<td>Introduction to Early Childhood Education</td>
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<tr>
<td>T&amp;L 311</td>
<td>Observing and Assessing Children</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 313</td>
<td>Language Development and Emerging Literacy</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 338</td>
<td>Home, School and Community Relations</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 453</td>
<td>Methods and Materials: Kindergarten</td>
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</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
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<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>4-16</td>
</tr>
</tbody>
</table>

These requirements may be impacted by change at the federal and state level.

**Middle Level Education**

**B.S.ED. with a Double Major in Elementary and a Major in Middle Level Education**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Graduation Requirements (see University ES listing).

The Integrated Studies Program is recommended.

II. EHD General Graduation Requirements (see EHD listing).

III. Elementary Education Curriculum (see Elementary Education listing).

IV. The following Middle Level Education (Grades 5-8) Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 341</td>
<td>Foundations of Middle Level Education</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 409</td>
<td>Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 465</td>
<td>Middle Level Curriculum and Methods</td>
<td>5</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1-4</td>
</tr>
<tr>
<td>T&amp;L 489</td>
<td>Senior Capstone: Responsive Teaching</td>
<td>3</td>
</tr>
</tbody>
</table>

V. Subject Matter Areas of Concentration

Students completing a double major in Elementary and Middle Level Education must take coursework in two content areas in addition to the Elementary and Middle Level major programs of study. These programs must be planned carefully between the student and the advisor in both programs of study to ensure that the requirements for teaching in the subject areas have been met. Examples of content areas include but are not limited to: English, mathematics, science, social studies, health, and technology education.

These requirements may be impacted by changes at the federal and state level.

Middle level advisers have lists of courses that may be recommended or required in certain areas.

In this combined major program, courses in Middle Level Education fulfill elective requirements in Elementary Education.

**B.S. ED. with Major in Middle Level Education**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Graduation Requirements (see University ES listing).

The Integrated Studies Program is recommended.

II. EHD General Graduation Requirements (see EHD listing).

III. The following Middle Level Education (Grades 5-8) Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of Exceptional Students</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
</tbody>
</table>

Admission to teacher education is required for enrollment in all of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 341</td>
<td>Foundations of Middle Level Education</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 409</td>
<td>Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 432</td>
<td>Learning Environments</td>
<td>2-3</td>
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<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 465</td>
<td>Middle Level Curriculum and Methods</td>
<td>5</td>
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</tbody>
</table>
A minimum of two methods courses in each area of concentration (see below) from the secondary education program and corequisite field experience (8)

T&L 486 Field Experience 1-4
T&L 487 Student Teaching 13
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3


Requires 24 credits in each area of concentration: see the middle level adviser for required coursework.

In order to be considered a highly qualified teacher at the Middle Level, candidates must take coursework in two content areas in addition to the Middle Level major program of study. This program must be planned carefully between the student and the middle school advisor to ensure that the requirements for teaching in the subject areas have been met. Examples of content areas include but are not limited to: English, mathematics, science, social studies, health, and technology education.

*These requirements may be impacted by changes at the federal and state level.

Secondary Education

Through a partnership with departments in the College of Arts and Sciences, candidates may seek secondary licensure in several areas. Requirements may vary depending upon the field of study, so candidates are advised to keep in close and regular contact with academic advisers from both Teaching and Learning and their academic discipline. Secondary education degrees are offered in science and social studies. Teacher licensure is also available in a number of disciplines upon completion of a bachelor’s degree in a related field in addition to the professional educational course sequence through the Department of Teaching and Learning. The following professional education sequence is required for most areas of licensure:

Secondary Education Licensure Preparation Sequence

Course Sequence (33 credits minimum):

Pre-admission:
T&L 250 Introduction to Education 3
T&L 319 Inclusive Strategies 3
Admission to Teacher Education is required for enrollment in all of the following courses:
T&L 339 Technology for Teachers 2
T&L 345 Curriculum Development and Instruction 3
T&L 350 Development and Education of the Adolescent 3
T&L 386 Field Experience 1
T&L 400 Methods and Materials 3-6
T&L 432 Learning Environments 2-3
T&L 433 Multicultural Education 3
T&L 486 Field Experience 1-4
T&L 495 Independent Study 1-4
T&L 487 Student Teaching 4-16
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3

* Optional
** To be accepted for student teaching, applicants must have a 2.75 GPA in their major and a 2.75 GPA overall in all coursework completed up to the time of application. Majors that require varied professional experiences complete 10 credits of student teaching. Students may enroll in several student teaching experiences to total 16 credits.

B.S.E.D. with Major in Science

Required 132 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Graduation Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

III. The following Science Curriculum:

A. Minimum of 24 semester hours in ONE of the four science areas (biology, chemistry, physics or earth science) through completion of a minor (24)

B. Minimum of 12 semester hours in your choice of each of two other areas as follows, plus a minimum of four semester hours in the fourth area (28)

Course List

Physics
PHYS 211 College Physics I 4
PHYS 212 College Physics II 4
PHYS 213 College Physics III 4
PHYS 251 University Physics I (Students taking the University Physics I must take Calculus I) 4
PHYS 252 University Physics II (Requires departmental/instructor approval to waive Calculus II) 4
PHYS 253 University Physics III (Requires departmental/instructor approval to waive Calculus III) 4

Chemistry
CHEM 121 General Chemistry I 4
& 121L General Chemistry I Laboratory
CHEM 122 General Chemistry II & 122L General Chemistry II Laboratory
CHEM 115 Introductory Chemistry 3
& 115L Introductory Chemistry Laboratory
CHEM 116 and Introductory Chemistry Laboratory
CHEM 333 and Analytical Chemistry Laboratory (CHEM 122 Prerequisite)

Earth Science
PHYS 110 and Introductory Astronomy 4
& 110L and Introductory Astronomy Lab
GEOL 101 and Introduction to Geology 4
& 101L and Introduction to Geology Laboratory
or GEOL 102 and The Earth Through Time 4
& 102L and The Earth Through Time Laboratory
& GEOG 121 and Global Physical Environment 4
& GEOG 121L and Global Physical Environment Laboratory
or GEOG 134 and Introduction to Global Climate 4
& GEOG 134L and Introduction to Global Climate Laboratory

Biology
BIOL 150 General Biology I 4
& 150L and General Biology I Laboratory
BIOL 151 General Biology II 4
& 151L and General Biology II Laboratory
BIOL 312 Evolution 4-6
& BIOL 315 and Genetics
B.S.Ed. with Composite Major in Social Studies

Required 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Graduation Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

III. The Following Curriculum:

Course List

- HIST 101 Western Civilization I 3
- HIST 102 Western Civilization II 3
- HIST 103 United States to 1877 3
- HIST 104 United States since 1877 3
- HIST 220 History of North Dakota 3
- HIST elective 300 level or above 3
- POLS 115 American Government I 3
- POLS 116 State and Local Government 3
- POLS 220 International Politics 3

Select one of the following: 3
- POLS 305 American Constitution-Governmental Powers
- POLS 306 American Constitution-Civil Liberties
- POLS 308 Intergovernmental Relations
- POLS 318 American Political Thought
- POLS 328 Legislative Processes
- POLS 329 Presidential Institutions and Management
- GEOG 161 World Regional Geography 3
- GEOG 262 Geography of North America I 3
- GEOG 419 Methods and Materials of Teaching Middle and Secondary School in Geographic Education 3

Select one of the following: 3
- GEOG 271 The Power of Maps
- GEOG 377 Quantitative Applications in Geography
- GEOG 471 Cartography and Visualization
- GEOG 474 Introduction to Geographic Information Systems (GIS)
- ECON 201 Principles of Microeconomics 3
- ECON 202 Principles of Macroeconomics 3
- ECON 303 Money and Banking 3

Select one of the following: 3
- ECON 210 Introduction to Business and Economic Statistics
- ECON 330 Business and Economic History

Electives:

Select one of the following teaching areas: 6
- PSYC 111 Introduction to Psychology
- PSYC 360 Introduction to Personality

Minor in Early Childhood Education

21 credits including:

- T&L 310 Introduction to Early Childhood Education 3
- T&L 311 Observing and Assessing Children 3
- T&L 313 Language Development and Emerging Literacy 3
- T&L 320 Infant and Toddler 3
- T&L 333 Methods and Materials: Pre-Kindergarten 3
- T&L 338 Home, School and Community Relations 3
- T&L 453 Methods and Materials: Kindergarten 2
- T&L 486 Field Experience 1

Total Credits 21

Minor in Middle Level Education (23 credits)

The Middle Level minor is open to students majoring in a field which leads to teacher licensure at the elementary or secondary level.

The following Middle Level Education (Grades 5-8) Curriculum is required:

- T&L 315 Education of Exceptional Students 3
- T&L 339 Technology for Teachers 2
- T&L 341 Foundations of Middle Level Education 2
- T&L 350 Development and Education of the Adolescent 3
- T&L 409 Reading in the Content Areas 3
- T&L 433 Multicultural Education 3
- T&L 465 Middle Level Curriculum and Methods 5
- T&L 486 Field Experience 1-4
- T&L 489 Senior Capstone: Responsive Teaching 3

Total Credits 25-28

Footnotes

Note: To teach any one of the electives in North Dakota requires 6 credits in the subject.

Students completing the Middle Level minor with a major in Elementary Education have exceeded the endorsement requirement for a highly qualified teacher (grade 7 or 8). Although, Elementary Education majors with a Middle Level minor will need to complete a major equivalence in a core academic subject. Students are encouraged to meet with the middle school adviser to ensure that the requirements for teaching in the middle school have been met.

Students completing the Middle School minor with a major in a Secondary Education academic area will be considered highly qualified in that core content area.

* These requirements may be impacted by changes at the federal and state level.
Minor in Literacy Education (20 credits)

The Literacy Education minor is open to students majoring in a field which leads to teacher certification at the early childhood, elementary, middle or secondary level. Students must be admitted to the Teacher Education program. Students from related disciplines such as Communication Science and Disorders may also be admitted. The program consists of 20 credits, which includes required and elective courses.

Students who complete the Literacy Education minor are eligible to apply for the North Dakota Reading Credential, which enables teachers to work as reading specialists at one of the following levels in North Dakota: K-6 (Elem or Elem/ECE double majors), 5-8 (Elem and Secondary with MLE minor or MLE major), 7-12 (Generalist Credential for English, Social Studies or Science majors).

Note: In North Dakota there is no Early Childhood Reading Credential. The coursework meets the requirements for the North Dakota Reading Credential.

Required Courses for the Elementary Education Major and Early Childhood/Elementary Education Double Major:

- T&L 319 Inclusive Strategies (Fall & Spring) 3
- T&L 409 Reading in the Content Areas (Spring) 3
- T&L 413 Assessing and Correcting Reading Difficulties (Summer) 2
- T&L 414 Corrective Reading Practicum (Summer) 2
- T&L 415 Language and Literacy Development of English Language Learners (Spring) 3

Select three of the following: * 7

- T&L 313 Language Development and Emerging Literacy (Fall) 3
- T&L 411 Primary Reading and Language Arts (Fall & Spring - Elementary only) 3
- T&L 416 Adolescent Literacy Development (Fall) 3
- T&L 486 Field Experience (In Literacy or ESL) 3
- T&L 329 Young Adult Literature 3
- or ENGL 359 Young Adult Literature 3

Total Credits 20

* cannot double count courses taken for your major

Required Courses for the Middle Level Major, Elementary Education/Middle Level Double Major and Secondary Education Major:

- T&L 319 Inclusive Strategies (Fall & Spring) * 3
- T&L 335 Understanding Readers and Writers (Fall & Spring - not for Elementary) 3
- T&L 409 Reading in the Content Areas (Spring) 3
- T&L 413 Assessing and Correcting Reading Difficulties (Summer) 2
- T&L 414 Corrective Reading Practicum (Summer) 2
- T&L 415 Language and Literacy Development of English Language Learners (Spring) 3
- T&L 416 Adolescent Literacy Development (Fall - not for Secondary Engl) 3
- T&L 417 Writing & Language Arts Methods (Fall, Spring) * 2

Select up to three of the following: ** 2-7

- T&L 313 Language Development and Emerging Literacy (Fall) 3
- T&L 411 Primary Reading and Language Arts (Fall, Spring) 3
- T&L 486 Field Experience (In Literacy or ESL) 3
- T&L 329 Young Adult Literature 3
- or ENGL 359 Young Adult Literature 3

Total Credits 23-28

** Cannot double count courses taken for your major.

Minor in Special Education (20 credits)

The following courses are required for a minor and should come before any subsequent courses:

- T&L 315 Education of Exceptional Students 3
- T&L 319 Inclusive Strategies 3
- T&L 423 Assessment Program Planning/Special Needs Students 3

For the minor, a minimum of 11 credits may be taken from several groups of courses which are described on the Special Education website available at www.und.edu/dept/tl/specedu/. In order to obtain teaching credentials in special education, students will need to complete additional coursework. Detailed descriptions of all programs and courses leading to the credentials, including prerequisites and course sequences are available on the Special Education website.

Courses

T&L 250. Introduction to Education. 3 Credits.

This course is designed for students exploring the profession of teaching in early childhood, elementary, middle, or secondary schools. It is an introduction to the study of education that explores the foundations of education, how learners differ, and the social and political contexts of schools. Students complete a classroom field experience, explore related literature, and participate in role-playing, simulations, and peer-teaching. This course also introduces students to both the INTASC Principles, which guide our preparation of teachers, and to the Senior Capstone Experience. Prerequisite: 30 completed credits. F.S.

T&L 252. Child Development. 3 Credits.

Study of the growth and developmental process through adolescence. A basis for understanding basic needs of the normal child and means of meeting them in the child's home and community environment. F.S.

T&L 286. Field Experience. 1 Credit.

Supervised tutorial or apprentice teaching experience in an early childhood, K-12 classroom, university or community setting approved by the program area. S/U grading. Prerequisite: Consent of instructor. Repeatable to 3 credits. S/U grading. F.S.

T&L 310. Introduction to Early Childhood Education. 3 Credits.

An overview of the early childhood education field, including an introduction to its historical roots; current theories, program models and issues; curriculum development; and typical and atypical development of young children. There will be a minimum of six hours of observation and/or activities in the field. F.S.

T&L 311. Observing and Assessing Children. 3 Credits.

This course acquaints the student with a variety of ways of observing, recording, and analyzing the behavior and development of children. Assessment of children will be analyzed by looking at a variety of assessment activities that can be done with children. There will be a minimum of eight hours of field experience. Prerequisites: Admission to Teacher Education Program and T&L 310. F.S.

T&L 313. Language Development and Emerging Literacy. 3 Credits.

This course examines both typical and atypical development of language and thought in children ages birth-8. Children's emergent literacy is studied within the context of language development. There will be a minimum of eight hours of field experience. Prerequisite: Admission to the Teacher Education program. F.

T&L 315. Education of Exceptional Students. 3 Credits.

An orientation course, especially for classroom teachers, stressing the identification, characteristics and educational problems of exceptional children. A field exercise is part of this course. F.S.

T&L 319. Inclusive Strategies. 3 Credits.

An introductory course dealing with the etiology of conditions and the characteristics affecting individuals with emotional disturbance, learning disabilities, and cognitive/developmental disabilities within the general education classroom. Instructional approaches and service delivery models within the general education classroom will also be explored. F.S.
T&L 320. Infant and Toddler. 3 Credits.
This course is a study of the child’s growth and development from birth to 36 months. It will give the student a basis for understanding normal developmental needs of children and means of meeting them in the children’s home and community environments. Prerequisite: T&L 252 or PSYC 250 or permission of instructor. F, S, SS.

T&L 322. Administration and Leadership in Early Childhood Education. 3 Credits.
An investigation of patterns of administration, curriculum organization, spatial resources, and staffing in early childhood settings, serving children 0-8 years old. Topics include federal and state laws and emerging trends in preschool and primary education in the state, region, and nation. Sixteen (16) hours of field experience. Prerequisite: Admission to the Teacher Education program. S.

T&L 328. Survey of Children’s Literature. 3 Credits.
Students survey the broad range of literature written for children. Emphasis is placed on gaining familiarity with the multicultural aspects of literature, understanding the distinguishing characteristics of genre, developing visual literacy with respect to illustration, and acquiring the ability to evaluate literature, as well as its use, with an understanding of children’s developmental needs. Prerequisite: Admission to the Teacher Education program. F, S.

T&L 329. Young Adult Literature. 3 Credits.
Discussion and critical evaluation of contemporary literature, both adolescent and adult, which is of interest to young adults, with an emphasis on fiction, drama, poetry, essays, and biographies. On demand.

T&L 333. Methods and Materials: Pre-Kindergarten. 3 Credits.
Exploration of curriculum, methods and materials for use in pre-kindergarten educational settings. Includes selection of materials, creative environments, and planning for the individual needs of children within a group setting. Prerequisites: T&L 310 and admission to the Teacher Education program. Corequisite: T&L 486. F, S, S.

T&L 335. Understanding Readers and Writers. 3 Credits.
This foundational course explores the developmental nature of literacy learning, the reading and writing processes, and the conditions for successful literacy learning. Holistic methods for assessing literacy are studied to understand individual language learners. Prerequisite: Admission to the Teacher Education program. F, S.

T&L 336. Social and Emotional Development and Guidance of Children. 3 Credits.
This course examines both typical and atypical social and emotional development in children ages 0-8 as a basis for understanding and working with children in educational settings. The course will also focus on child guidance and behavior issues affecting classroom climate. S, SS.

T&L 338. Home, School and Community Relations. 3 Credits.
The course is an exploration of home school relations. The content will include history, parental involvement in schools, parent-teacher conferences, home visits, parent programs, and resources for parents. F, S, S.

T&L 339. Technology for Teachers. 2 Credits.
Students will demonstrate a sound understanding of technology concepts and operations that not only support classroom curriculum but provide an avenue for continuing professional development. Students will learn to apply technology to facilitate a variety of effective assessment and evaluation strategies. The class will help students understand the social, ethical, legal and human issues that surround the use of technology in PK-12 schools. Prerequisite: Admission to the Teacher Education program. F, S, S.

T&L 341. Foundations of Middle Level Education. 2 Credits.
This course promotes understanding the needs of early adolescent students and of the interdisciplinary, collaborative teaching approaches associated with the middle school philosophy. The course addresses the components of organization. Prerequisite: Admission to the Teacher Education program. F, S.

T&L 345. Curriculum Development and Instruction. 3 Credits.
A general curriculum development and instruction course designed for the undergraduate pre-service secondary teacher across all disciplines. It introduces and provides practice in planning, multiple instructional strategies, and methods of formal and informal assessment. It considers the impact of historical foundations, teaching philosophy, discipline standards, knowledge of diverse learners and special needs, and technology on curriculum development. Prerequisites: Admission to Teacher Education Program and T&L 250. F, S.

T&L 350. Development and Education of the Adolescent. 3 Credits.
A comprehensive examination of the characteristics and behavior of the adolescent student with implications for curriculum and instruction in the junior/middle and high schools. Topics covered will be transition from childhood to adolescence, including cognitive development, self-concept, physiological changes, social needs and values, and values and attitudes of adolescents. This course will provide an understanding of the wide range of differences in developmental patterns of children and the influences of economic, sociological and psychological factors in development. A field experience is part of the course. Prerequisites: Admission to Teacher Education Program and T&L 250. F, S.

T&L 370. Differentiated Instruction. 3 Credits.
An introduction to the principles of differentiation including responsive instructional and assessment strategies, learner preferences, and the dynamics of a differentiated learning environment. Managing and organizing a differentiated approach to teaching is also presented. S.

T&L 386. Field Experience. 1 Credit.
Supervised tutorial or apprentice teaching, experience in an early childhood, K-12 classroom, university or community setting approved by the program area. Optional. Prerequisites: Admission to Teacher Education Program and T&L 250. S/U grading. F, S.

T&L 390.* Special Topics. 1-3 Credits.
May be repeated. Prerequisite: Admission to the Teacher Education Program. Repeatable.

T&L 400. Methods and Materials. 3 Credits.
Various teaching methods and strategies and the materials used in teaching in a subject area. (Some Methods and Materials courses carry an academic department prefix and number. The number of methods courses required by a department may vary. Consult with an adviser.) Some offered F only: some F, S. See adviser. Prerequisites: T&L 250 and T&L 345, and admission to the Teacher Education program. Corequisites: T&L 486. Repeatable to 18 credits. F, S.

T&L 401. School Safety Science. 1 Credit.
Prepares students to plan for and communicate about a wide variety of classroom and laboratory safety issues. Health and safety issues are examined for the classroom teacher and the students in all science courses, including electrical safety, biological safety, chemical use, storage and disposal, legal issues, liability reduction and cost control are also addressed in detail. Prerequisites: Admission to Teacher Education Program. Corequisite: T&L 400. F.

T&L 409. Reading in the Content Areas. 3 Credits.
This course emphasizes instructional strategies for reading and writing, as well as the use of varied texts, in the content area classroom. Prerequisite: Admission to the Teacher Education program. S.

T&L 410. Teaching Reading in the Elementary School Classroom (TEAM). 3 Credits.
A study of methods for teaching and assessing reading in the elementary school classroom with an emphasis on planning instruction that is child-centered, process-oriented and literature-based. Prerequisite: Admission to the Teacher Education program; see department for approval. F, S.

T&L 411. Primary Reading and Language Arts. 2 Credits.
This course explores a wide variety of developmentally-appropriate instructional practices for teaching primary level children multiple ways of communicating and experiencing language. This course emphasizes integrating reading, writing, speaking and listening as forms of creative and personal expression. Effective methods of teaching children to decode and encode print are studied. Prerequisites: T&L 335 and admission to the Teacher Education program. Prerequisite or Corequisite: T&L 328. F, S.

T&L 413. Assessing and Correcting Reading Difficulties. 2 Credits.
The focus of this course and practicum is to learn about current approaches to assessment and methods to assist students who are having difficulty with reading and writing. Observations, running records, interviews, and other evaluation procedures are used to learn about reader and writers, and these assessments are used to plan for instruction. Prerequisites: T&L 335 and admission to the Teacher Education program. Corequisites: T&L 414. SS.

T&L 414. Corrective Reading Practicum. 2 Credits.
Applying the knowledge and skills learned in T&L 413, students in this practicum assess, plan for and teach children who are having difficulty with reading and/or writing. Prerequisites: T&L 335 and admission to the Teacher Education program. Corequisites: T&L 413. SS.
T&L 415. Language and Literacy Development of English Language Learners. 3 Credits.
This course includes study of various approaches to ELL/bilingual education, methods of instruction, assessment of English language proficiency and classroom learning, and teaching academic content to ELLs in the general education classroom. Prerequisite: Admission to the Teacher Education program or permission of instructor. S.

T&L 416. Adolescent Literacy Development. 3 Credits.
A study of adolescent literacy development with emphasis on instructional strategies and practices for reading and responding to texts, helping struggling readers, and engagement in literacy. Prerequisite: Admission to the Teacher Education program or permission of instructor. F.

T&L 417. Writing & Language Arts Methods. 2 Credits.
A study of methods for teaching writing and language arts to children in grades K-6. Emphasis is placed on process-oriented writing approaches; spelling and grammar; ways of using language for creative, personal, and content area expression. Prerequisites: Admission to Teacher Education Program and T&L 35 and T&L 328. F.S.

T&L 422. Development of the Gifted and Talented. 2 Credits.
Research and theory for understanding the development needs of the more able child in early childhood and in educational experiences. S.

T&L 423. Assessment Program Planning/Special Needs Students. 3 Credits.
A study of the principles and practices of: (1) obtaining diagnostic information on school-related problems of a student; (2) assimilating this information and prescribing appropriate alterations based on continuous measurement data. Prerequisites: T&L 315 and T&L 319. F.S.


T&L 428. Assistive Technology. 1 Credit.
An overview of the various forms of technology (e.g., communication boards, switches, software) that may be used to assist students with disabilities. F,SS.

T&L 430. Social Studies in the Elementary School (Team). 3 Credits.
To understand and analyze the different modes of teaching social studies, to gain the competencies necessary for organizing a unit in the social studies, to gain an understanding of the values and multiple perspectives inherent within the various teaching strategies, to develop a preferred perspective on the ideal nature of Social Studies education. Prerequisite: Admission to the Teacher Education program; see department for approval. F,S.

T&L 432. Learning Environments. 3 Credits.
The purpose of this class is to study psychological, social, and cultural factors that influence classroom behavior and to examine elements that contribute to a positive learning environment. A field experience is include in the course. Prerequisite: Admission to the Teacher Education program. F,SS.

T&L 433. Multicultural Education. 3 Credits.
This class takes an anthropological view of multicultural education. It will help students better understand students in culturally diverse classrooms as well as preparing them to teach about cultural diversity. This class examines several cultures but is particularly interested in Native Americans of North Dakota. Prerequisite: Admission to the Teacher Education program. F,SS.

T&L 440. Mathematics in Elementary School (Team). 3 Credits.
Students explore how to facilitate the learning of mathematics in a constructivist environment through the use of investigations, manipulatives, technology, and holistic forms of assessment. Current trends in teaching mathematics are emphasized, with particular attention to documents created by the National Council of Teachers of Mathematics. Prerequisite: Admission to the Teacher Education program; see department for approval. F, S.

T&L 443. Mathematics for Primary Grades. 2 Credits.
Math for Primary Grades focuses on curriculum and methods for teaching mathematics in kindergarten through the third grade. Students actively engage in projects and activities that help them develop a conceptual understanding of teaching mathematics in a cooperative and constructivist environment where children view themselves as as mathematicians. Emphasis is placed on the use of manipulative, problem solving activities and children's literature in the planning and organizing of developmentally appropriate classroom activities and lessons. Prerequisite: Admission to the Teacher Education program. F, S.

T&L 444. Math for Intermediate Grades. 2 Credits.
Math for Intermediate Grades is an elective course that focuses on curriculum and methods for teaching mathematics in grades four through six. The course focuses on teaching mathematics and understanding in a cooperative environment and involves participants in projects and activities that develop conceptual understanding. F.

T&L 453. Methods and Materials: Kindergarten. 2 Credits.
Exploration of curriculum, methods, and materials for use in kindergarten settings. Prerequisites: Admission to Teacher Education Program and T&L 310. F, S, SS.

T&L 456. Early Childhood Ed Seminar. 1 Credit.
This seminar continues the exploration of curriculum, methods, and materials issues as they are presented in the particulars of the student teaching experience. Prerequisites: T&L 333 and admission to Teacher Education Program. Corequisite: T&L 487. F, S.

T&L 465. Middle Level Curriculum and Methods. 5 Credits.
This methods course takes a hands-on approach to increasing understanding and application of the various methods and strategies for teaching early adolescent students. This course addresses techniques, strategies, materials, and a content area knowledge base necessary for promoting student learning and success in a middle school setting. Prerequisite: T&L 341. Corequisite: T&L 486. S.

T&L 470. Science in the Elementary School (TEAM). 3 Credits.
A survey of teaching strategies, materials, and resources appropriate for promoting science inquiry in elementary classrooms. Prerequisite: Admission to the Teacher Education program; see department for approval. F, S.

T&L 471. Physical Science in the Elementary School. 1-4 Credits.
Hands-on approach to learning basic physical science topics such as electricity, sound, light, and force. Effective teaching strategies are also emphasized. F,S.

T&L 472. Teaching Life Science in the Elementary School. 2 Credits.
Hands-on approach to learning basic biology topics such as cells, plants, animals, and ecosystems. Effective teaching strategies are also emphasized. F, S.

T&L 473. Earth and Space Science. 1-4 Credits.
Hands-on approach to learning basic earth and space science topics such as erosion, plate tectonics, water quality, pollution, astronomy, planets, and the solar system. Effective teaching strategies are emphasized. SS.

T&L 486. Field Experience. 1-4 Credits.
Supervised tutor or apprentice teaching experience in an early childhood, K-12 classroom, university, or community setting approved by the program area. Prerequisite: Admission to the Teacher Education program. Repeatable to 16 credits. S/U grading. F, S.

T&L 487. Student Teaching. 4-16 Credits.
Provides student with the opportunity to assume the role of a classroom teacher in an educational setting under the supervision of a cooperating teacher and a University faculty member. Prerequisites: Permission of program, senior standing only. Prerequisite or Corequisite: T&L 488. Repeatable. S/U grading. F, S.

T&L 488. Senior Seminar. 1 Credit.
A discussion of problems, professional obligations, and careers in teaching. To be taken concurrently with or the semester prior to student teaching. Prerequisite: T&L 488 to be taken concurrently with or the semester prior to student teaching. S/U grading.

T&L 489. Senior Capstone: Responsive Teaching. 3 Credits.
Course is taken with student teaching. Teacher candidates engage in written communication and critical thinking in the context of student teaching. Course engagements require candidates to develop and implement curriculum and assessment; analyze and reflect on assessment results to respond to learners' needs; and synthesize professional artifacts to demonstrate ability to plan, implement, assess and reflect on teaching and learning. Corequisite: Acceptance into Student Teaching. F, S.

T&L 493. Workshop. 1-4 Credits.
Special problems in Special Education; consideration of special problems of concern to the Special Education teacher and other educators. Repeatable to 8 credits. F, S.
T&L 495. Independent Study. 1-4 Credits.
This course is designed for the interested student's pursuit of an area of study not offered through regular courses. In addition, students can continue to pursue subject matter covered in courses in greater depth. Repeatable to 8 credits.

T&L 498. Special Projects. 1-8 Credits.
Course number reserved for committee approved proposals, independent study, special colloquia, or experimental courses.

* Other approved courses may meet this requirement. Prerequisite: admission to teacher education.

Theatre Arts (Thea)

http://www.arts-sciences.und.edu/theatre-arts

Cherry, Gunther, Matic, Murry, Ray, Reissig, and Weatherly (Chair)

The Department of Theatre Arts at the University of North Dakota strives to achieve educational theatre of the highest quality by maintaining professional standards and practice through teaching, creative activity/research, and service.

The Department of Theatre Arts fulfills the mission through the following objectives:

1. To provide a quality liberal arts foundation for all theatre majors.
2. To provide experiences that will engender an appreciation and understanding of theatre and how it enriches our life.
3. To provide academic training and practical experience appropriate for students who wish to pursue careers in theatre or who wish to continue their studies at an advanced professional or graduate program.
4. To serve as a cultural resource for the university community and the general public.

The Department of Theatre Arts aims to fulfill the objectives through the following goals:

1. All theatre majors will successfully complete the University Essential Studies courses and demonstrate significant levels of competency through completion of a Senior Project.
2. Majors and non-majors will improve creative thinking skills through theatre courses within the essential studies curriculum.
3. Majors will achieve competency in at least one of the following areas: acting, musical theatre, design and technology, or general studies in theatre.
4. The Department of Theatre will serve the university region, and state through quality performance of a rich variety of theatre styles.

The University of North Dakota is accredited by the National Association of Schools of Theatre (NAST). The curriculum of the Department of Theatre Arts provides students with opportunities to pursue a Bachelor of Fine Arts and a Bachelor of Arts. All undergraduate theatre majors share a common set of core courses. The Bachelor of Fine Arts is an in-depth integrated curriculum for theatre majors. The Bachelor of Fine Arts in Musical Theatre is a pre-professional degree that requires a high level of proficiency in theatrical performance and is an appropriate preparation for students who wish to pursue professional careers in musical theatre. The Department offers a minor in Theatre and a minor in Dance.

The Department of Theatre Arts integrates the classroom curriculum with applied, experiential learning in production. Our production season offers a rich variety of styles and genres, including musicals. Student directors and designers may apply to stage a production in the Burtness Lab Theatre.

Productions are staged in the Burtness Theatre, which boasts a fully-equipped, 365 seat, proscenium-stage and Blackbox (Lab) Theatre.

Bachelor of Fine Arts in Musical Theatre

The Bachelor of Fine Arts program is offered to students with marked abilities who desire an intensive undergraduate concentration in Theatre Arts. In preparation for either a career in professional theatre, or graduate study leading to the MFA, or both. Candidates accepted for the program will be expected to maintain a high standard of excellence and to demonstrate significant artistic growth.

Candidates seeking admission to the BFA in Musical Theatre audition as incoming freshmen or transfer students. Each student auditioning will be required to submit a resume and the BFA in Musical Theatre Program Application found on the Theatre website along with a headshot if available. Each freshman and transfer student auditioning and seeking scholarship monies will be required to complete the Freshman Scholarship Form found on the Theatre website. All applications must be submitted to the Theatre department office a week prior to auditioning. In order to receive scholarship monies, each student must be a major in the Theatre Arts department.

For information regarding auditioning, please contact the head of the Musical Theatre program.

All applying for acceptance into the BFA in Musical Theatre program must demonstrate a satisfactory competence in scholarship, vocal ability, acting, and theatre knowledge. In order to demonstrate competence in scholarship, each student applying to the program must hold a cumulative 2.5 GPA. In order to demonstrate competence in Theatre Knowledge, students must submit a theatrical resume listing his/her production work. In order to demonstrate competence in vocal and acting ability, each student will complete an audition for the program. Faculty members in Theatre Arts in the programs of acting, dance, and musical theatre will be responsible for determining acceptance into the program.

B.F.A. in Musical Theatre with a Major in Theatre Arts (p. ) B.A. with a Major in Theatre Arts (p. )

College of Arts and Sciences

B.F.A. in Musical Theatre with a Major in Theatre Arts

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (See University ES listing): 36 credit hours

II. The Following Curriculum:

Major Requirements

Music Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td>1</td>
</tr>
<tr>
<td>Choral Ensemble (audition required)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Individual Lessons (taken every semester)*</td>
<td>16</td>
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</tr>
</tbody>
</table>

Theatre Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 110</td>
<td>Introduction to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>THEA 120</td>
<td>Voice and Movement I</td>
<td>2</td>
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<tr>
<td>THEA 161</td>
<td>Acting I</td>
<td>3</td>
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<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
<td>1</td>
</tr>
<tr>
<td>THEA 220</td>
<td>Voice and Movement II</td>
<td>2</td>
</tr>
<tr>
<td>THEA 230</td>
<td>Text Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 240</td>
<td>Ballet I</td>
<td>2</td>
</tr>
<tr>
<td>THEA 241</td>
<td>Jazz Dance I</td>
<td>2</td>
</tr>
<tr>
<td>THEA 242</td>
<td>Tap Dance</td>
<td>1</td>
</tr>
<tr>
<td>THEA 270</td>
<td>Stagecraft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 271</td>
<td>Intermediate Acting I: The Actor in You</td>
<td>3</td>
</tr>
<tr>
<td>THEA 225</td>
<td>Makeup for the Stage</td>
<td>3</td>
</tr>
<tr>
<td>THEA 204</td>
<td>Introduction to Acting for Musical Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 300</td>
<td>Play Direction I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 371</td>
<td>Advanced Acting: Advanced Scene Study</td>
<td>3</td>
</tr>
<tr>
<td>THEA 344</td>
<td>Musical Theatre Dance Style</td>
<td>2</td>
</tr>
<tr>
<td>THEA 404</td>
<td>Acting for the Music Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 423</td>
<td>History of the Theatre: Classical, Medieval and Renaissance</td>
<td>3</td>
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</tbody>
</table>
THEA 424  History of the Theatre: Seventeenth Century to the Present  3
THEA 494  Senior Project  4
THEA 450  Musical Theatre History  3

**Electives**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 243</td>
<td>Contemporary Dance I</td>
<td>2</td>
</tr>
<tr>
<td>THEA 330</td>
<td>Contemporary Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 340</td>
<td>Ballet II</td>
<td>2</td>
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<tr>
<td>THEA 341</td>
<td>Jazz Dance II</td>
<td>2</td>
</tr>
<tr>
<td>THEA 342</td>
<td>Contemporary Dance II</td>
<td>2</td>
</tr>
<tr>
<td>THEA 425</td>
<td>Play Direction II</td>
<td>3</td>
</tr>
<tr>
<td>THEA 442</td>
<td>Choreography</td>
<td>3</td>
</tr>
<tr>
<td>THEA 471</td>
<td>Advanced Acting III: Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td>THEA 488</td>
<td>Playwriting</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 242</td>
<td>Diction for Singers</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 269</td>
<td>Opera Workshop</td>
<td>1</td>
</tr>
<tr>
<td>Others by Advisor Approval</td>
<td></td>
<td>12</td>
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</table>

*Course number for individual lessons determined at registration.*

**B.A. with a Major in Theatre Arts**

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (Thea 424 fulfills the Essential Studies Capstone requirement.) 39 cr.

II. 28 credits in the Theatre Core for all BA students

III. Selection of a Track from either Acting, Design/Tech, or Generalist

IV. 45 credits of Electives. Electives can be any theatre course not in the student's current degree plan or other courses as approved by the student's advisor.

V. The following curriculum:

28 credits, including:

**THEATRE CORE**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 110</td>
<td>Introduction to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>THEA 161</td>
<td>Acting I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
<td>1</td>
</tr>
<tr>
<td>THEA 225</td>
<td>Makeup for the Stage</td>
<td>3</td>
</tr>
<tr>
<td>THEA 230</td>
<td>Text Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 270</td>
<td>Stagecraft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 300</td>
<td>Play Direction I</td>
<td>3</td>
</tr>
<tr>
<td>or THEA 335</td>
<td>Stage Management</td>
<td></td>
</tr>
<tr>
<td>THEA 330</td>
<td>Contemporary Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 423</td>
<td>History of the Theatre: Classical, Medieval and Renaissance</td>
<td>3</td>
</tr>
<tr>
<td>THEA 424</td>
<td>History of the Theatre: Seventeenth Century to the Present</td>
<td>3</td>
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</table>

*Students Select One of the Following Tracks:*

**Acting Track**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 271</td>
<td>Intermediate Acting I: The Actor in You</td>
<td>3</td>
</tr>
<tr>
<td>THEA 371</td>
<td>Advanced Acting: Advanced Scene Study</td>
<td>3</td>
</tr>
<tr>
<td>THEA 120</td>
<td>Voice and Movement I</td>
<td>2</td>
</tr>
<tr>
<td>THEA 220</td>
<td>Voice and Movement II</td>
<td>2</td>
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<tr>
<td>THEA 204</td>
<td>Introduction to Acting for Musical Theatre</td>
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</table>

**Design/Tech Track**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>THEA 427</td>
<td>Costume Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 426</td>
<td>Scene Design for the Stage</td>
<td>3</td>
</tr>
<tr>
<td>THEA 326</td>
<td>Lighting for Stage I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 260</td>
<td>Costume Craft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
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</table>

**Generalist Track**

Level II Proficiency in a Foreign Language

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>THEA 300</td>
<td>Play Direction I (Generalists are required to take THEA 300 AND THEA 335)</td>
<td>3</td>
</tr>
<tr>
<td>or THEA 335</td>
<td>Stage Management</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum (1 credit, to be repeated for 2 credits)</td>
<td>2</td>
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</table>

**Minor in Theatre Arts**

Required 25 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 110</td>
<td>Introduction to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>THEA 161</td>
<td>Acting I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
<td>1</td>
</tr>
<tr>
<td>THEA 330</td>
<td>Contemporary Theatre</td>
<td>3</td>
</tr>
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</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>THEA 260</td>
<td>Costume Craft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 270</td>
<td>Stagecraft</td>
<td>3</td>
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</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>THEA 300</td>
<td>Play Direction I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 335</td>
<td>Stage Management</td>
<td>3</td>
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Select two of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>THEA 225</td>
<td>Makeup for the Stage</td>
<td>3</td>
</tr>
<tr>
<td>THEA 230</td>
<td>Text Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 271</td>
<td>Intermediate Acting I: The Actor in You</td>
<td>3</td>
</tr>
<tr>
<td>THEA 326</td>
<td>Lighting for Stage I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 425</td>
<td>Play Direction II</td>
<td>3</td>
</tr>
<tr>
<td>THEA 426</td>
<td>Scene Design for the Stage</td>
<td>3</td>
</tr>
<tr>
<td>THEA 427</td>
<td>Costume Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 488</td>
<td>Playwriting</td>
<td>3</td>
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</table>

Total Credits 25

**Minor in Dance**

Required 20 credits, including:

Select six of the following (Dance Technique):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>THEA 240</td>
<td>Ballet I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 241</td>
<td>Jazz Dance I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 242</td>
<td>Tap Dance</td>
<td>2</td>
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<tr>
<td>THEA 243</td>
<td>Contemporary Dance I</td>
<td>3</td>
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<tr>
<td>THEA 340</td>
<td>Ballet II</td>
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<tr>
<td>THEA 341</td>
<td>Jazz Dance II</td>
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<tr>
<td>THEA 342</td>
<td>Contemporary Dance II</td>
<td>3</td>
</tr>
<tr>
<td>THEA 344</td>
<td>Musical Theatre Dance Style &amp; THEA 161 and Acting I</td>
<td>3</td>
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<tr>
<td>THEA 442</td>
<td>Choreography</td>
<td>3</td>
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Select two of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
<td>2</td>
</tr>
</tbody>
</table>

Additional technique class/classes
Courses

THEA 110. Introduction to Theatre Arts. 3 Credits.
Basic orientation and historical perspective to theatre arts. Study of the roles of playwright, director, actor, designer, producer, and audience members in current theatre practice. Course will include attendance at area performances. Course includes 16 hours of experiential work in scene/costume shop or on a production. F,S.

THEA 120. Voice and Movement I. 2 Credits.
Development of the student's physical and vocal awareness. Emphasis on freeing the actor and identifying personal habitual response patterns. F.

THEA 161. Acting I. 3 Credits.
Basic principles of acting with emphasis on movement; basic character development through improvisation and script. F,S.

THEA 201. Theatre Practicum. 1 Credit.
Participation in theatre pre-performance and performance capacities, both technical and acting, under faculty direction. Repeatable to 8 hours. Repeatable to 8 credits. F,S.

THEA 204. Introduction to Acting for Musical Theatre. 3 Credits.
An introduction to the unique style of performance techniques for musical theatre including voice and movement work, acting, and staging. Prerequisite: THEA 161. F, even years.

THEA 210. Selected Topics in Theatre. 1-3 Credits.
Topics of special interest to faculty and students, such as Stage Management, and others. Repeatable up to 9 credits. Repeatable to 9 credits. On demand.

THEA 220. Voice and Movement II. 2 Credits.
A sequential continuation of Theatre 120: Voice and Movement I with focus on freeing the channel for sound, improving range, and articulation. Emphasis in movement will be on posture and introducing somatic techniques. Prerequisite: THEA 120 or consent of instructor. S, even years.

THEA 225. Makeup for the Stage. 3 Credits.
Introduction to the basic techniques of makeup for the stage design and application. F.

THEA 230. Text Analysis. 3 Credits.
An analysis of the dramatic text from the standpoint of production and performance. Prerequisites: THEA 110 or THEA 130. S.

THEA 240. Ballet I. 2 Credits.
An introductory ballet class designed to introduce students to the fundamentals of ballet. This class will contain a ballet barre, warm-up, barre stretch, an adagio center combination and floor exercises designed to enhance alignment, flexibility, strength and center. Repeatable to 6 credits. F.

THEA 241. Jazz Dance I. 2 Credits.
This course is designed to introduce the student to principles and techniques characteristic of jazz dance. Students will execute movement combinations in a variety of jazz styles. Emphasis will be placed on movement fundamentals of alignment, flexibility, endurance, dynamic range, and strength. Repeatable to 6 credits. F, odd years.

THEA 242. Tap Dance. 1 Credit.
This class is designed to introduce the student to the basic principles of tap dance. Warm-up, exercises, and combinations in tap technique will provide opportunities for the student to develop an efficient use of weight, alignment, articulation of footwork, coordination, and musicality. Repeatable to 4 credits. F.

THEA 243. Contemporary Dance I. 2 Credits.
Introduction to the elements of contemporary dance and practice of the fundamentals of the technique with attention given to both the art and craft of the dance form. Emphasis on postural alignment, shape, sequence, flexibility, as well as the body in relation to space, time, force, and movement initiation. Repeatable to 6 credits. F.

THEA 250. Readings in Dramatic Literature. 3 Credits.
Readings in dramatic literature from ancient to contemporary, with a strong emphasis on written and verbal analysis of realist texts. On demand.

THEA 260. Costume Craft. 3 Credits.
An introduction to the basic principles, theory, and techniques of costume construction. This hands-on class will reach from basic to advanced skills. On demand.

THEA 270. Stagecraft. 3 Credits.
This course is intended to teach the basic functions, aesthetics, history, methods and materials of scenery, properties, lighting and sound. Practical experience, shop procedures are tied to hands-on experience in departmental productions. F.

THEA 271. Intermediate Acting I: The Actor in You. 3 Credits.
An introduction to the Meisner Technique and to scene study. Special emphasis will be placed on using and trusting yourself to inform your work, working together, and applying rehearsal techniques to scripted work. Prerequisite: THEA 161 or consent of instructor. F.

THEA 300. Play Direction I. 3 Credits.
Principles and techniques of directing for the theatre. Student laboratory directing experiences. Prerequisites: THEA 161 and THEA 230. F, odd years.

THEA 325. Scene Craft. 3 Credits.
Specialized construction and rigging of scenery, advanced technology applications to the stage, drafting projects and practical problem solving. Prerequisites: THEA 270. On demand.

THEA 326. Lighting for Stage I. 3 Credits.
The principles, mechanics and design of stage and lighting; its relationship to set, makeup and costume design; plus laboratory participation in University productions. Prerequisite: THEA 270 or consent of instructor. S, odd years.

THEA 330. Contemporary Theatre. 3 Credits.
Readings in dramatic literature from 1880s to contemporary times. Strong emphasis on written and verbal analysis of current dramatic techniques beyond realism. S, odd years.

THEA 335. Stage Management. 3 Credits.
An introduction to the procedures, responsibilities, and best practices for stage management. F.

THEA 336. Lighting for Stage II. 3 Credits.
The principles, mechanics and design of stage and television lighting; its relationship to set, makeup and costume design; plus laboratory participation in University productions. Prerequisite: THEA 270 or consent of instructor. S, even years.

THEA 339. Production Design. 3 Credits.
The development of the entire theatrical event, from conception to closing, with particular attention to the collaboration of various artists, craftspersons, and managers. Prerequisites: THEA 130, THEA 226, THEA 270 and THEA 300, or consent of instructor. S.

THEA 340. Ballet II. 2 Credits.
Ballet II is a continuation of Ballet I. Students will continue to develop advanced ballet skills and technique in relationship to form, strength, flexibility, center, line, choreography and physical expression. Prerequisite: THEA 240 or consent of instructor. Repeatable to 6 credits. S.

THEA 341. Jazz Dance II. 2 Credits.
This course is designed to be a continuation of THEA 241. Students continue to explore the principles and techniques characteristic of jazz dance through a variety of jazz dance styles. Emphasis will be placed on applying efficient form and dynamic energy to intermediate level movement combinations in center and across the floor. Prerequisites: THEA 241. Repeatable to 6 credits. S.

THEA 342. Contemporary Dance II. 2 Credits.
In this course students will continue to refine the skills learned in Contemporary Dance I and explore the principles and techniques characteristic of contemporary dance. Emphasis will be placed on correct alignment, spatial awareness, musicality, and dynamic energy as applied to intermediate level movement combinations. Prerequisite: THEA 243 or consent of instructor. Repeatable to 6 credits. S.

THEA 344. Musical Theatre Dance Style. 2 Credits.
In this course students will learn the vocabulary, styles, and techniques associated with musical theatre dance. Building upon the movement basics learned in the prerequisite courses, students will refine their dance skills and increase their knowledge base through the practice and assimilation of repertory from the classic musical theatre. Prerequisites: THEA 241. S.

THEA 371. Advanced Acting: Advanced Scene Study. 3 Credits.
Advanced script analysis applied to plays that place advanced demands on the actor. Prerequisites: THEA 272 or consent of instructor. F.
THEA 397. Cooperative Education. 1-6 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department, and employer. Repeatable to 12 credits. Prerequisites: GPA of 2.5 and junior standing. Repeatable to 12 credits. F,S,SS.

THEA 404. Acting for the Music Theatre. 3 Credits.
Appreciation of and performance techniques for musical theatre including: voice and movement work, acting, and staging. Prerequisite: Consent of instructor. S, odd years.

THEA 415. Selected Problems in Theatre Arts. 1-3 Credits.
Topics of special interest to faculty and students, such as Theatre Management, Women's Issues in Drama, Polish Theatre and Drama, Improvisation, Scene Painting, and others. Repeatable up to 9 credits. Repeatable to 9 credits. On demand.

THEA 423. History of the Theatre: Classical, Medieval and Renaissance. 3 Credits.
The theatre in performance. The origins of theatrical forms and their relationships to acting style, physical theatre and audience with the cultural environment. F, even years.

THEA 424. History of the Theatre: Seventeenth Century to the Present. 3 Credits.
A continuation of topics covered in THEA 423 beginning with the Seventeenth Century and continuing to the present. Student need not take THEA 424 prior to enrolling in THEA 424. S, odd years.

THEA 425. Play Direction II. 3 Credits.
A continuation of THEA 300 with emphasis on contemporary theories, analysis, research, conceptualization, and implementation. Laboratory experience. Prerequisite: THEA 300 or consent of instructor. S, even years.

THEA 426. Scene Design for the Stage. 3 Credits.
The analysis, research, and conceptualization of the physical context of theatre productions. Emphasis on individual creative projects. Repeatable up to 6 hours. Prerequisite: THEA 270. Repeatable to 6 credits. F.

THEA 427. Costume Design. 3 Credits.
Elements, principles, and styles of design applied to the visual creation of a dramatic character. Repeatable up to 6 credits. Prerequisites: THEA 260 or consent of instructor. Repeatable to 6 credits. S, even years.

THEA 442. Choreography. 3 Credits.
An introduction to choreography that offers the student training in the sequential application of basic principles of movement and form to a small group of dancers. Prerequisites: THEA 342 or consent of instructor. S, odd years.

THEA 450. Musical Theatre History. 3 Credits.
A survey of the history of musical theatre in performance, genre and world presence. Prerequisite: THEA 204. F, even years.

THEA 471. Advanced Acting III: Shakespeare. 3 Credits.

THEA 481. Theatre Practicum. 1-2 Credits.
Projects in all areas of theatre and interpretation in a supervisory capacity. Specific assignments in production/planning with faculty approval. Repeatable to 8 hours. Repeatable to 8 credits. F,S.

THEA 488. Playwriting. 3 Credits.
The playwright's problems as revealed through practice of writing plays: experimental productions of the student's creative work whenever possible. Repeatable up to 6 hours. Prerequisite: Sufficient background in theatrical arts and creative writing and consent of instructor. Repeatable to 6 credits. F, odd years.

THEA 494. Senior Project. 4 Credits.
Individual work in an approved area. Prerequisite: Theatre BA or BFA students only. F,S.

University Courses (UNIV)

University courses fall into four distinct categories:

• UNIV 101 Introduction to University Life is a two-credit course specifically for students in their first semester at UND. This course includes a strong focus on the academic and social transition from high school to college.

• UNIV 110 First Year Seminar and UNIV 115 First Year Research – First-Year Seminars – are three-credit courses specifically for students in their first semester at UND. These courses involve a rigorous study of an academic topic or theme, while paying specific attention to those things that help students make a successful transition to college.

• UNIV 125 Introduction to Effective Study Skills and UNIV 127 Critical Thinking Strategies for College are two-credit courses designed to promote specific academic success strategies for students at any level.

• UNIV 228 Non-UND Affiliated Study Abroad and UNIV 229 Study Abroad are variable-credit courses used to grant credit for certain study abroad experiences.

More information about UNIV 101 Introduction to University Life and UNIV 110 First Year Seminar/UNIV 115 First Year Research can be found in the General Information section (under “Opportunities for First-Year Students (p. 14)” of this academic catalog.

Courses

UNIV 101. Introduction to University Life. 2 Credits.
Designed to promote the personal and academic success of first-year students. Topics covered include study skills, time and stress management, campus resources, involvement, health and wellness, communication, understanding diversity, critical thinking, and building relationships with faculty members. Academic issues involving this course will be handled through the College of Education and Human Development. Prerequisite: Freshman Only. F,S.

UNIV 110. First Year Seminar. 3 Credits.
This seminar course is specifically meant to help first-year students make a successful transition to college, and has been designed to engage students in the academic life of the university through the study of a topic of theme. To accomplish these goals, students in this course will consider and practice being reflective about their own learning, being an active and engaged learner, and studying effectively. Only students in their first year at UND may register for this course. Prerequisite: Only students in their first year at UND may register for this course. On demand.

UNIV 115. First Year Research. 3 Credits.
This course is specifically meant to help first-year students make a successful transition to college, and has been designed to engage students in the academic life of the university through an intensive research experience. To accomplish these goals, students in this course will consider and practice being reflective about their own learning, being an active and engaged learner, and studying effectively. Only students in their first year at UND may register for this course. Prerequisite: Only students in their first year at UND may register for this course. On demand.

UNIV 125. Introduction to Effective Study Skills. 2 Credits.
This course explores issues relevant to both a student's academic and personal lives. As its name implies, a large portion of this course is devoted to effective study skills and habits. The course examines various aspects of learning styles, studying skills, test taking strategies, etc. This information is helpful in assisting students to succeed. (A maximum total of 2 credits from UNIV 125, UNIV 126, and UNIV 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F,S.

UNIV 126. College Reading. 2 Credits.
This course is designed to assist college students progress from a pre-college reading level to a college reading level. It also presents a systematic way of approaching college textbook material that can help students to become more efficient in study skills integral to their college success. Comprehension skills will be introduced early in the course and integrated throughout the class. The exercises prepare students to read a selection and give them an opportunity to apply comprehension and study skills during and after reading. (A maximum total of 2 credits from UNIV 125, UNIV 126, and UNIV 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F,S.

UNIV 127. Critical Thinking Strategies for College. 2 Credits.
This course is designed for students who want to develop and improve advanced academic techniques, to successfully engage in active learning through critical thinking, metacognitive skills, acquire learning attitudes, and prepare for success in academics and the workplace environment. (A maximum total of 2 credits from UNIV 125, UNIV 126, and UNIV 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F,S.
**UNIV 228. Non-UND Affiliated Study Abroad.**
Course required of students studying abroad to maintain student status; required Sophomore status and cumulative GPA of 2.50; prior to registration, students will be involved in study abroad procedures inclusive of study abroad application, pre-departure orientation, credit transfer, and related study abroad processes outlined in the Study Abroad Handbook; courses to be taken during the study abroad semester must have pre-approval of appropriate academic department, and courses and grades earned are entered as transfer credit upon transfer back to UND. Academic issues involving this course will be handled through the College of Arts and Sciences. Repeatable. F,S,SS.

**UNIV 229. Study Abroad.**
1 to 12 credit equivalents in any one semester (repeatable with permission of the student's academic department); course required of students studying abroad to maintain full-time status; required Sophomore status and cumulative GPA of 2.50; prior to registration, students will be involved in study abroad procedures inclusive of study abroad application, pre-departure orientation, credit transfer, and related study abroad processes outlined in the Study Abroad Handbook; courses to be taken during the study abroad semester must have pre-approval of appropriate academic department, and courses and grades earned are entered as transfer credit upon transfer back to UND. Academic issues involving this course will be handled through the College of Arts and Sciences. Repeatable. F,S,SS.

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**Women and Gender Studies (WGS)**

http://www.arts-sciences.und.edu/women-and-gender-studies

Women and Gender Studies at the University of North Dakota is an interdisciplinary academic program which includes courses from the traditional disciplines, as well as an introductory course in gender studies (WGS 200), a course in women studies (WGS 225), a theory course (WGS 480), and a senior course (WGS 492) offered through the College of Arts and Sciences.

Women and Gender Studies examines the complex interaction of gender with other features of human difference, particularly those that result in social inequality. Topics of study include women's achievements and their contributions to history and contemporary life; the performance of femininity and masculinity; the influence of gender in the shaping of identity, the family, public institutions, and human symbol systems, generally.

The program at UND was established in 1982 under the name of Women Studies, and a minor was approved by the Board of Higher Education in 1984. Students planning careers in law, counseling, business, communication, medicine, education, social service, and the sciences find a Women and Gender Studies major (offered through the Interdisciplinary Studies Program) or minor to be a highly useful and exciting plan of study. Other students choose Women and Gender Studies courses to provide coherence in their Essential Studies Requirements. In general, the Women and Gender Studies program at UND advocates a pluralism of interests, theories, and approaches that traverse traditional academic structures to provide students an understanding and appreciation of marginalized perspectives and experiences that can inform and transform whatever field they choose to enter.

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**College of Arts and Sciences**

**Major in Interdisciplinary Studies: Women and Gender Studies**

I. Essential Studies Requirements (see University ES listing).

II. A minimum of 36 credits, including 9 required WGS course credits (WGS 200, WGS 225, WGS 480) and 27 elective credits (list below is not all-inclusive of elective possibilities). Please consult Women and Gender Studies Director to confirm plan of study:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 200</td>
<td>Introduction to Gender Studies</td>
<td>3</td>
</tr>
<tr>
<td>WGS 225</td>
<td>The Study of Women</td>
<td>3</td>
</tr>
<tr>
<td>WGS 480</td>
<td>Feminist Theory</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 372</td>
<td>Culture Theory</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 357</td>
<td>Women Writers and Readers (repeatable when topics vary)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 302</td>
<td>Women, Crime, and Criminal Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 361</td>
<td>Victiology</td>
<td>3</td>
</tr>
<tr>
<td>COMM 310</td>
<td>Media and Diversity</td>
<td>3</td>
</tr>
<tr>
<td>HIST 332</td>
<td>Women in Early America</td>
<td>3</td>
</tr>
<tr>
<td>HIST 333</td>
<td>Women in Modern America</td>
<td>3</td>
</tr>
<tr>
<td>IS 346</td>
<td>Gender in American Indian Cultures</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 360</td>
<td>Feminist Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>POLS 321</td>
<td>International Human Rights</td>
<td>3</td>
</tr>
<tr>
<td>POLS 351</td>
<td>Women and Politics</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 210</td>
<td>Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 365</td>
<td>Psychology of Women</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 421</td>
<td>Diversity Psychology</td>
<td>3</td>
</tr>
<tr>
<td>RELS 216</td>
<td>Women and Religion</td>
<td>3</td>
</tr>
<tr>
<td>RELS 466</td>
<td>Sex, Gender and Religion</td>
<td>3</td>
</tr>
<tr>
<td>SOC 335</td>
<td>Families in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>SOC 340</td>
<td>Sociology of Gender</td>
<td>3</td>
</tr>
<tr>
<td>WGS 492</td>
<td>Senior Study: Women and Gender Studies</td>
<td>1-4</td>
</tr>
<tr>
<td>ANTH 375</td>
<td>Women in Prehistory</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 357</td>
<td>Women Writers and Readers (repeatable when topics vary)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 302</td>
<td>Women, Crime, and Criminal Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 361</td>
<td>Victiology</td>
<td>3</td>
</tr>
<tr>
<td>COMM 310</td>
<td>Media and Diversity</td>
<td>3</td>
</tr>
<tr>
<td>HIST 332</td>
<td>Women in Early America</td>
<td>3</td>
</tr>
<tr>
<td>HIST 333</td>
<td>Women in Modern America</td>
<td>3</td>
</tr>
<tr>
<td>IS 346</td>
<td>Gender in American Indian Cultures</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Minor in Women and Gender Studies**

Twenty credits of courses in Women and Gender Studies completed with a GPA of at least 2.0 are required for the minor.

I. Required courses (total credits 9):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 200</td>
<td>Introduction to Gender Studies</td>
<td>3</td>
</tr>
<tr>
<td>WGS 225</td>
<td>The Study of Women</td>
<td>3</td>
</tr>
<tr>
<td>WGS 480</td>
<td>Feminist Theory</td>
<td>3</td>
</tr>
</tbody>
</table>

II. At least three of the following (total credits 11):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 357</td>
<td>Women Writers and Readers (may be repeated once when topics vary)</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 365</td>
<td>Psychology of Women</td>
<td>3</td>
</tr>
<tr>
<td>HIST 333</td>
<td>Women in Modern America</td>
<td>3</td>
</tr>
<tr>
<td>RELS 216</td>
<td>Women and Religion</td>
<td>3</td>
</tr>
<tr>
<td>SOC 340</td>
<td>Sociology of Gender</td>
<td>3</td>
</tr>
<tr>
<td>COMM 310</td>
<td>Media and Diversity</td>
<td>3</td>
</tr>
<tr>
<td>CJ 361</td>
<td>Victiology</td>
<td>3</td>
</tr>
<tr>
<td>IS 346</td>
<td>Gender in American Indian Cultures</td>
<td>3</td>
</tr>
<tr>
<td>SOC 335</td>
<td>Families in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>POLS 351</td>
<td>Women and Politics</td>
<td>3</td>
</tr>
<tr>
<td>WGS 492</td>
<td>Senior Study: Women and Gender Studies</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Students may declare a major or minor through the College of Arts and Sciences and should also contact the Director of Women and Gender Studies to design a program of study.

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**Courses**

**WGS 200. Introduction to Gender Studies. 3 Credits.**
An introduction to the social construction of gender, a concept that underlies research in women studies and the new masculinity studies—indeed, of much work in the humanities and social sciences, generally. Topics may include the role of gender in the formation of human symbol systems and institutions worldwide, as well as its capacity to shape individual bodies, identities, and kinship relations. F.S.

**WGS 225. The Study of Women. 3 Credits.**
An introduction to the study of women as subjects of scholarly inquiry, with emphasis on transnational feminism and assessments of women's contributions around the globe. The course will provide an interdisciplinary focus on the central issues and questions posed by the new scholarship on women, and introduce students to the perspectives and methodologies of a variety of disciplines. F.S.
WGS 480. Feminist Theory. 3 Credits.
Feminist theory examines the foundations of American feminism from enlightenment liberal to postmodern and standpoint theories. The course first develops then critiques these fundamental approaches. Opportunities are provided to integrate mainstream and marginal experiences of feminist theory and its practice. Prerequisites: WGS 200 or WGS 225. On demand.

WGS 492. Senior Study: Women and Gender Studies. 1-4 Credits.
Supervised independent study involving a theory paper, practicum experience, or a combination of the two. Prerequisites: WGS 200 or WGS 225. On demand.
Four Year Plans

Four-year plans are designed to help full-time degree-seeking undergraduate students to determine the best way to select a major and progress through coursework required to complete their bachelor’s degree.

Students are encouraged to review their major’s four-year plan, and to work with their academic advisor to ensure they meet the degree requirements, can plan for distinctive education engagement experiences such as internships, and successfully complete their program of study for graduation.

Four-year plans:
- Specify degree requirements for each major
- Provide semester-based course schedule models to complete in four years
- Incorporate Essential Studies and elective course requirements progressions
- Allow departments and advisors to create graduation progression benchmarks and review progress with student

The plans for each major can be found for each of the colleges and schools. Please use the links in the left navigation.

College of Arts and Sciences

| B.A. with Major in American Indian Studies | (p. 255) |
| B.A. with Major in Anthropology | (p. 257) |
| B.S. with Major in Biology |
| B.S. in Chemistry |
| B.S. with Major in Chemistry |
| B.A. with Major in Communication |
| B.A. with Major in Communication Sciences and Disorders |
| B.A. with Major in Computer Science/B.S. in Computer Science |
| B.S. in Criminal Justice Studies |
| B.A. with Major in Economics |
| B.A. with Major in English |
| B.S. with Major in Forensic Science |
| B.S. with Major in Geography |
| B.F.A. with major in Graphic Design and New Art Media |
| B.A. with Major in History |
| B.A. or B.S. in Honors |
| B.M. with Major in Instrumental Performance | (p. 276) |
| B.A. with Major in International Studies | (p. 278) |
| B.A. with Major in Language: Chinese Studies; Classical Studies; French; German Studies; Norwegian; Spanish |
| B.S. with Major in Mathematics | (p. 281) |
| B.A. with Major in Music | (p. 283) |
| B.M. with Major in Music Education | (p. 287) |
| B.M. with Major in Music Therapy |
| B.F.A. in Musical Theatre with Major in Theatre Arts |
| B.A. with Major in Philosophy and Religion |
| B.S. with Major in Physics |
| B.A. or B.S. with Major in Psychology |
| B.A. with Major in Sociology |
| B.A. in Theatre Arts with Major in Theatre Arts |
| B.A. or B.F.A. with Major in Visual Arts |
| B.M. with Major in Vocal Performance |

American Indian Studies

B.A. with a Major in American Indian Studies A (AIS as second major) (p. 255)
B.A. with a Major in American Indian Studies B (four years; even year freshman enrollment) (p. 256)
B.A. with a Major in American Indian Studies C (four years; uneven year freshman enrollment) (p. 256)
B.A. with a Major in American Indian Studies A (AIS as second major)

| Freshman Year |
| Summer | Credits |
| Essential Studies/First Major/Electives | 6 |
| Credits | 6 |
| Fall | Credits |
| Essential Studies/First Major/Electives | 15 |
| Credits | 15 |
| Spring | Credits |
| Essential Studies/First Major/Electives | 15 |
| Credits | 15 |

Sophomore Year

| Summer | Credits |
| First Major/Essential Studies/Electives | 6 |
| Credits | 6 |
| Fall | Credits |
| First Major/Essential Studies/Electives | 15 |
| Credits | 15 |
| Spring | Credits |
| First Major/Essential Studies/Electives | 15 |
| Credits | 15 |

Junior Year

| Summer | Credits |
| Recommended: Internship (IS 430) or Elective/First Major/Essential Studies | 3 |
| Credits | 3 |
| Fall | Credits |
| Elective/First Major/essential Studies | 3 |
| IS 121 | Introduction to American Indian Studies | 3 |
| or IS 122 | or American Indians and Tradition | 3 |
| or IS 123 | or American Indians and Culture | 3 |
| IS 230 | Approaches to Native Cultures | 3 |
| IS 360 | Oral Traditions in American Indian Cultures | 3 |
| Credits | 12 |

Spring | Credits |
| Electives/First Major/Essential Studies | 12 |
| IS 348 | Beyond the Reservation | 3 |
| Credits | 15 |
This is an example of a course of study leading to a BA in American Indian Studies. Plans of courses differ between even and uneven years. Please visit with an American Indian Studies faculty member to determine a personalized plan. Students need to satisfy all published Essential Studies requirements. To determine how to best fulfill these requirements and the electives requirements in the American Indian Studies major, students should visit with an American Indian Studies faculty member. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

**B.A. with a Major in American Indian Studies**

**B (four years; even year freshman enrollment)**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer</strong></td>
<td></td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>IS 121 or IS 122 or IS 123</td>
<td>Introduction to American Indian Studies or American Indians and Tradition or American Indians and Culture</td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Sophomore Year</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>American Indian Studies elective</td>
<td>3</td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td>IS 395</td>
<td>Ethnohistory of North America</td>
</tr>
<tr>
<td></td>
<td>15</td>
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<tr>
<td><strong>Junior Year</strong></td>
<td></td>
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<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>9</td>
</tr>
<tr>
<td>IS 230</td>
<td>Approaches to Native Cultures</td>
</tr>
<tr>
<td>IS 360</td>
<td>Oral Traditions in American Indian Cultures</td>
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<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>12</td>
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</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>IS 395</td>
<td>Ethnohistory of North America</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>126</td>
</tr>
</tbody>
</table>

This is an example of a course of study leading to a BA in American Indian Studies. Please visit with an American Indian Studies faculty member to determine a personalized plan. Students need to satisfy all published Essential Studies requirements. To determine how to best fulfill these requirements and the electives requirements in the American Indian Studies major, students should visit with an American Indian Studies faculty member. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

**B.A. with a Major in American Indian Studies C (four years; uneven year freshman enrollment)**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer</strong></td>
<td></td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>IS 121 or IS 122 or IS 123</td>
<td>Introduction to American Indian Studies or American Indians and Tradition or American Indians and Culture</td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Sophomore Year</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>American Indian Studies elective</td>
<td>3</td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td>IS 348</td>
<td>Beyond the Reservation</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Junior Year</strong></td>
<td></td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
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<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies/Second Major</td>
<td>9</td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>9</td>
</tr>
<tr>
<td>IS 395</td>
<td>Ethnohistory of North America</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

This is an example of a course of study leading to a BA in American Indian Studies. Please visit with an American Indian Studies faculty member to determine a personalized plan. Students need to satisfy all published Essential Studies requirements. To determine how to best fulfill these requirements and the electives requirements in the American Indian Studies major, students should visit with an American Indian Studies faculty member. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>9</td>
<td>Electives/Essential Studies/Second Major</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>IS 360 Oral Traditions in American Indian Cultures</td>
</tr>
</tbody>
</table>

| Spring   | 12      | Electives/Essential Studies/Second Major |
|          | 3       | Concentration Electives |

Total Credits: 126

This is an example of a course of study leading to a BA in American Indian Studies. Please visit with an American Indian Studies faculty member to determine a personalized plan. Students need to satisfy all published Essential Studies requirements. To determine how to best fulfill these requirements and the electives requirements in the American Indian Studies major, students should visit with an American Indian Studies faculty member. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

**Anthropology**

**B.A. with a Major in Anthropology**

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>3</td>
<td>ANTH 170 Introduction to Biological Anthropology or ANTH 171 or ANTH 172 Introduction to Cultural Anthropology or ANTH 170 or ANTH 172 Introduction to Archaeology</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ENGL 110 College Composition I</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>General Electives</td>
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<tr>
<td></td>
<td>3</td>
<td>Essential Studies: Social Science</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Essential Studies: Arts</td>
</tr>
</tbody>
</table>

Total Credits: 15

| Spring   | 4       | Essential Studies: Science Lab |
|          | 3       | Essential Studies: Humanities (U) |
|          | 3       | ANTH 171 Introduction to Cultural Anthropology or ANTH 170 or ANTH 172 Introduction to Biological Anthropology or ANTH 170 or ANTH 172 Introduction to Archaeology |
|          | 3       | ENGL 130 Composition II: Writing for Public Audiences |
|          | 3       | Essential Studies: Social Science |

Total Credits: 15

**Sophomore Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>3</td>
<td>ANTH 172 Introduction to Archaeology or ANTH 170 or ANTH 171 Introduction to Biological Anthropology or ANTH 170 or ANTH 171 Introduction to Cultural Anthropology</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>9 credits in the concentration must be taken at 300 level or above.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Essential Studies: Math, Science and Technology (Q)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Essential Studies: Arts or Humanities</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>General Electives</td>
</tr>
</tbody>
</table>

Total Credits: 15

| Spring   | 3       | Concentration Electives |
|          | 3       | ANTH 350 Ethnographic Methods or ANTH 371 or ANTH 372 |

Total Credits: 18

**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>3</td>
<td>Anthology Elective</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>General Elective</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Concentration</td>
</tr>
</tbody>
</table>

Total Credits: 125

This plan of study represents just one way in which a student can complete the requirements for the Bachelor of Arts in Anthropology within four years. Because of the large number of ways to complete the degree requirements for this major, students should always consult their adviser for assistance regarding their specific plan of study. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

**Biology**

**B.S. with Major in Biology - Ecology and Evolutionary Biology Option**

**B.S. with Major in Biology, Fisheries and Wildlife**

**B.S. with Major in Biology - General Option**

**B.S. with Major in Biology - Molecular, Cellular, and Developmental Biology Option**

**B.S. with Major in Biology, Molecular and Integrative - Basic Life Science Option**

**B.S. with Major in Biology, Molecular and Integrative- Enhanced Applied Life Science Option**
B.S. with Major in Biology - Pre-Health Sciences Emphasis

B.S. with Major in Biology - Ecology and Evolutionary Biology Option

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td></td>
</tr>
<tr>
<td>Orientation to the Biology Major</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
<td></td>
</tr>
<tr>
<td>&amp; 150L</td>
<td></td>
</tr>
<tr>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; General Biology I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td></td>
</tr>
<tr>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td></td>
</tr>
<tr>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td></td>
</tr>
<tr>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 146</td>
<td></td>
</tr>
<tr>
<td>or Calculus I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
</tr>
</tbody>
</table>

Spring

| BIOL 151              |         |
| General Biology II    | 4       |
| & 151L                |         |
| and General Biology II Laboratory |       |
| CHEM 122              |         |
| General Chemistry II  | 4       |
| & 122L                |         |
| and General Chemistry II Laboratory |       |
| ENGL 130              |         |
| Composition II: Writing for Public Audiences | 3     |
| COMM 110              |         |
| Fundamentals of Public Speaking | 3     |
| Essential Studies Elective | 3-4   |
|                      | 17-18   |

Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 315</td>
<td></td>
</tr>
<tr>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 315R</td>
<td></td>
</tr>
<tr>
<td>and Genetics Recitation</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 332</td>
<td></td>
</tr>
<tr>
<td>General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 332L</td>
<td></td>
</tr>
<tr>
<td>and Gen Ecology Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 341</td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>&amp; 341L</td>
<td></td>
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<tr>
<td>and Organic Chemistry I Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>General Electives</td>
<td>5</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>21-22</td>
</tr>
</tbody>
</table>

Spring

| BIOL 312              |         |
| Evolution             | 4       |
| & 312R                |         |
| and Evolution Recitation | 1     |
| BIOL 341              |         |
| Cell Biology          | 3       |
| CHEM 342              |         |
| Organic Chemistry II  | 5       |
| & 342L                |         |
| and Organic Chemistry II Laboratory | 3 |
| OR                    |         |
| CHEM 340              |         |
| Survey of Organic Chemistry | 5   |
| & 340L                |         |
| and Survey of Organic Chemistry Laboratory | 3 |
| Essential Studies Elective | 3-4  |
| General Elective      | 5       |
|                      | 3-4     |
|                      | 23-25   |

Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BIOL 470</td>
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<tr>
<td>Biometry</td>
<td>4</td>
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<tr>
<td>PHYS 211</td>
<td></td>
</tr>
<tr>
<td>College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>Biology Elective</td>
<td>4</td>
</tr>
<tr>
<td>General Elective</td>
<td>5</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>17-20</td>
</tr>
</tbody>
</table>

Spring

| BIOL 376              |         |
| Animal Biology        | 4       |
| & 376L                |         |
| and Animal Biology Laboratory | 2 |
| OR                    |         |
| BIOL 350              |         |
| Plant Biology (offered in odd years only) | 3 |
| PHYS 212              |         |
| College Physics II    | 4       |

The B.S. with Major in Biology with the Ecology and Evolutionary Biology option is designed for students interested in ecology, evolutionary biology, and related areas. This is one possible way to complete the degree in 4 years but there is flexibility to allow students to customize the program of study to their own needs including allowing for semesters with internships or study abroad. Students are highly encouraged to meet with their advisor to personalize their program of study.

1 = Recitations are optional but if desired should be taken at the same time as the lecture course.

2 = Students are required to take 4 upper level labs. These courses meet the upper level lab requirement.

3 = Organic chemistry requirement can be met either by taking Chem 341/L 342/L, or Chem 341/L BMB 301, or Chem 340/L BMB 301. Note that Chem 340/L and BMB 301 are offered in the same semester so it takes 2 years to complete that option. Students considering medical school are encouraged to take Chem 341/341L, Chem 342/342L, and BMB 301 because some medical schools require or prefer this combination

4 = A minimum of 13 credits of Biology Electives are required with at least 5 credits from the following list (Biol 333, Biol 338, Biol 433, Biol 439). Students can use up to 2 life sciences courses offered outside the Biology Department toward the Biology Electives (e.g., Anat 204, Mbio 302, Mbio 328, PPT 301). There are some restrictions so students should check the catalog carefully or talk with their advisor if thinking about using outside courses.

5 = This major requires 3-4 credit hours from Geog 134/134L, Geog 471/471L, Geog 474, Geol 101/101L, Geol 102/102L.

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.S. with Major in Biology, Fisheries and Wildlife

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 121</td>
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</tr>
<tr>
<td>Introduction to Fisheries and Wildlife Biology</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
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<tr>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td></td>
</tr>
<tr>
<td>and General Biology I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td></td>
</tr>
<tr>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td></td>
</tr>
<tr>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td></td>
</tr>
<tr>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
</tr>
</tbody>
</table>

Spring

| BIOL 312              |         |
| Evolution             | 4       |
| & 312R                |         |
| and Evolution Recitation | 1     |
| BIOL 341              |         |
| Cell Biology          | 3       |
| CHEM 342              |         |
| Organic Chemistry I   | 5       |
| & 342L                |         |
| and Organic Chemistry II Laboratory | 3 |
| OR                    |         |
| CHEM 340              |         |
| Survey of Organic Chemistry | 5   |
| & 340L                |         |
| and Survey of Organic Chemistry Laboratory | 3 |
| Essential Studies Elective | 3-4  |
| General Elective      | 5       |
|                      | 3-4     |
|                      | 23-25   |

B.S. with Major in Biology - Ecology and Evolutionary Biology Option

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td></td>
</tr>
<tr>
<td>Orientation to the Biology Major</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
<td></td>
</tr>
<tr>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td></td>
</tr>
<tr>
<td>and General Biology I Laboratory</td>
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</tr>
<tr>
<td>CHEM 121</td>
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<tr>
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<td>4</td>
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<tr>
<td>&amp; 121L</td>
<td></td>
</tr>
<tr>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td></td>
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<tr>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 146</td>
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</tr>
<tr>
<td>or Calculus I</td>
<td></td>
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<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
</tr>
</tbody>
</table>

Spring

| BIOL 151              |         |
| General Biology II    | 4       |
| & 151L                |         |
| and General Biology II Laboratory |       |
| CHEM 122              |         |
| General Chemistry II  | 4       |
| & 122L                |         |
| and General Chemistry II Laboratory |       |
| ENGL 130              |         |
| Composition II: Writing for Public Audiences | 3     |
| COMM 110              |         |
| Fundamentals of Public Speaking | 3     |
| Essential Studies Elective | 3-4   |
|                      | 17-18   |

Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 315</td>
<td></td>
</tr>
<tr>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 315R</td>
<td></td>
</tr>
<tr>
<td>and Genetics Recitation</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 332</td>
<td></td>
</tr>
<tr>
<td>General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 332L</td>
<td></td>
</tr>
<tr>
<td>and Gen Ecology Lab</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 341</td>
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</tr>
<tr>
<td>Organic Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>&amp; 341L</td>
<td></td>
</tr>
<tr>
<td>and Organic Chemistry I Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>General Electives</td>
<td>5</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>21-22</td>
</tr>
</tbody>
</table>

Spring

| BIOL 312              |         |
| Evolution             | 4       |
| & 312R                |         |
| and Evolution Recitation | 1     |
| BIOL 341              |         |
| Cell Biology          | 3       |
| CHEM 342              |         |
| Organic Chemistry II  | 5       |
| & 342L                |         |
| and Organic Chemistry II Laboratory | 3 |
| OR                    |         |
| CHEM 340              |         |
| Survey of Organic Chemistry | 5   |
| & 340L                |         |
| and Survey of Organic Chemistry Laboratory | 3 |
| Essential Studies Elective | 3-4  |
| General Elective      | 5       |
|                      | 3-4     |
|                      | 23-25   |
## B.S. with Major in Biology - General Option

### Freshman Year

**Fall**
- BIOL 120 Orientation to the Biology Major 1
- BIOL 150 General Biology I 4
  & 150L and General Biology I Laboratory 4
- CHEM 121 General Chemistry I 4
  & 121L and General Chemistry I Laboratory 4
- ENGL 110 Composition II: Writing for Public Audiences 3
- Credits 15-16

**Spring**
- BIOL 312 Evolution 4
  & 312R and Evolution Recitation 1
- BIOL 333 Population Biology 3
- Biology Electives 2 6-8
- Essential Studies Elective 3-4
- Credits 16-19

### Sophomore Year

**Fall**
- BIOL 336 Systematic Botany 4
  or BIOL 439 or Conservation Biology 4
- BIOL 397 Cooperative Education 1
- BIOL 431 Wildlife Management 4
  or BIOL 432 or Techniques in Wildlife Population Assessment 4
- BIOL 470 Biometry 4
- Essential Studies Elective 3-4
- Credits 16-17

**Spring**
- BIOL 438 Fisheries Management 3-4
  or BIOL 430 or Human Dimensions of Wildlife and Fisheries 3-4
- Biology Electives 2 6-8
- General Elective 3-4
- Essential Studies Elective 3-4
- Credits 15-20

### Junior Year

**Fall**
- BIOL 336 Systematic Botany 3-4
  or BIOL 439 or Conservation Biology 3-4
- BIOL 431 Wildlife Management 4
  or BIOL 432 or Techniques in Wildlife Population Assessment 4
- Biology Electives 2 3-4
- General Elective 3-4
- Essential Studies Elective 3-4
- Credits 3-4

**Spring**
- BIOL 438 Fisheries Management 3-4
  or BIOL 430 or Human Dimensions of Wildlife and Fisheries 3-4
- BIOL 481 Fisheries & Wildlife Senior Capstone 3
- GEOG 474 Introduction to Geographic Information Systems 3
  & 474L (GIS) and GIS Laboratory 3
- Essential Studies Elective 3-4
- General Elective 3-4
- Credits 15-18
- Total Credits 129-149

The B.S. with Major in Fisheries and Wildlife Biology is designed to prepare students for careers in state, private and federal fisheries and wildlife or conservation organizations. A summer internship or cooperative education experience is required between the sophomore and junior or junior and senior year. This is one possible way to complete the degree in 4 years but there is flexibility to allow students to customize the program of study to their own needs. Students are highly encouraged to meet with their advisor to personalize their program of study.

1 = Recitations are optional but if desired should be taken at the same time as the lecture course.

2 = A minimum of 12 credits of Biology Electives are required with all 12 credits either from the following list (BIOL 338, BIOL 350, BIOL 360, BIOL 363, BIOL 364/364L, BIOL 376/376L, BIOL 380, BIOL 425, BIOL 426, BIOL 433, BIOL 434) or any of BIOL 430, BIOL 431, BIOL 432, and BIOL 438 NOT used to meet the advanced management courses requirement.

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
CHEM 342 Organic Chemistry II and Organic Chemistry II Laboratory 3 5
& 342L

OR

& 340L

Essential Studies Elective 3-4
General Elective 3-4

Credits 24-26

Junior Year

Fall

PHYS 211 College Physics I 4
BIOL 470 Biometry 3-4
or SOC 326 or Sociological Statistics

Biology Elective 4 3-4
General Elective 3-4
Essential Studies Elective 3-4

Credits 16-20

Spring

PHYS 212 College Physics II 4
Biology Electives 4 6-8
BMB 301 Biochemistry (Or General Elective) 3 3
General Elective 3-4

Credits 16-19

Senior Year

Fall

BIOL 480 Senior Capstone Seminar (Or Biology Elective) 4 3-4
Biology Electives 6-8
General Elective 3-4
Essential Studies Elective 3-4

Credits 15-20

Spring

BIOL 480 Senior Capstone Seminar (Or Biology Elective) 4 3-4
Biology Electives 6-8
General Elective 3-4
Essential Studies Elective 3-4

Credits 15-20

Total Credits 139-160

This is one possible way to complete the degree in 4 years. The B.S. with Major in Biology with the General Biology option is designed to be flexible to allow students to customize the program of study to their own needs including allowing for semesters with internships or study abroad. Students are encouraged to meet with their advisor to personalize their program of study.

1 = Recitations are optional but if desired should be taken at the same time as the lecture course.

2 = Students are required to take 4 upper level labs. Biol 332L and 341L would go toward the upper level lab requirement but students do not have to take Biol 332L or 341L.

3 = Organic chemistry requirement can be met either by taking Chem 341/L 342L, or Chem 341/L BMB 301, or Chem 340/L BMB 301. Note that Chem 340/L and BMB 301 are offered in the same semester so it takes 2 years to complete that option. Students considering medical school are encouraged to take Chem 341/L, Chem 342/342L, and BMB 301 because some medical schools require or prefer this combination.

4 = Biology electives are any 300 and 400 level biology courses not used to meet other program requirements (i.e., not a core course or capstone course). Students can use up to 2 life sciences courses offered outside the Biology Department toward the Biology Electives (e.g., Anat 204, Mbio 302, Mbio 328, PPT 301). There are some restrictions so students should check the catalog carefully or talk with their advisor if thinking about using outside courses.

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.S. with Major in Biology - Molecular, Cellular, and Developmental Biology Option

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major 1</td>
</tr>
<tr>
<td>BIOL 150 &amp; BIOL 151L</td>
<td>General Biology I and General Biology II Laboratory</td>
</tr>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I 3</td>
</tr>
<tr>
<td>MATH 146 or MATH 165</td>
<td>Applied Calculus I or Calculus I 3-4</td>
</tr>
</tbody>
</table>

| Credits | 15-16 |

| Spring | |
| BIOL 151 & 151L | General Biology II and General Biology II Laboratory |
| CHEM 122 & 122L | General Chemistry II and General Chemistry II Laboratory |
| COMM 110 | Fundamentals of Public Speaking 3 |
| ENGL 130 | Composition II: Writing for Public Audiences 3 |
| Essential Studies Elective 3-4 |

| Credits | 17-18 |

| Sophomore Year | Fall |
| BIOL 315 & 315R | Genetics and Genetics Recitation 1 |
| BIOL 332 | General Ecology 3 |
| CHEM 341 & 341L | Organic Chemistry I and Organic Chemistry I Laboratory 3 |
| OR | 5 |
| General Electives 5 |
| Essential Studies Elective 3-4 |

| Credits | 20-21 |

| Spring | |
| BIOL 312 & 312R | Evolution and Evolution Recitation 1 |
| BIOL 341 & 341L | Cell Biology and Cell Biol Lab 2 |
| CHEM 342 & 342L | Organic Chemistry II and Organic Chemistry II Laboratory 3 |
| OR | 5 |
| Essential Studies Elective 3-4 |
| General Elective 3-4 |

| Credits | 24-26 |

| Junior Year | Fall |
| BIOL 378 | Developmental Biology 3 |
| BIOL 470 or SOC 326 | Biometry or Sociological Statistics 3-4 |
| PHYS 211 | College Physics I 4 |
| General Elective 3-4 |
| Essential Studies Elective 3-4 |

| Credits | 16-19 |

| Spring | |
| BMB 301 | Biochemistry (Or General Elective) 3 |
| BIOL 415 | Genomics 2 |
| PHYS 212 | College Physics II 4 |
The B.S. with Major in Biology with the Molecular, Cellular, and Developmental Biology option is designed for students interested in cellular and sub-cellular processes underlying biological phenomena. This is one possible way to complete the degree in 4 years but there is flexibility to allow students to customize the program of study to their own needs including allowing for semesters with internships or study abroad. Students are highly encouraged to meet with their advisor to personalize their program of study.

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm).

---

**B.S. with Major in Biology, Molecular and Integrative - Basic Life Science Option**

### Freshman Year

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<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
</tr>
<tr>
<td>BIOL 150 &amp; 150L</td>
<td>General Biology I and General Biology I Laboratory</td>
</tr>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>MATH 146 or MATH 165</td>
<td>Applied Calculus I</td>
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<td>Credits</td>
<td>15-16</td>
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### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 410 or BIOL 480</td>
<td>Molecular Biology Techniques 2 or Senior Capstone Seminar</td>
</tr>
<tr>
<td>Biology Electives 4</td>
<td>6-8</td>
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<tr>
<td>General Elective</td>
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<tr>
<td>Essential Studies Elective</td>
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### Senior Year

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<tr>
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<tr>
<td>BIOL 410 or BIOL 480</td>
<td>Molecular Biology Techniques 2 or Senior Capstone Seminar</td>
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<td>Biology Electives 4</td>
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### Sophomore Year

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<tr>
<td>BIOL 315 &amp; 315R</td>
<td>Genetics and Genetics Recitation 1</td>
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<tr>
<td>BIOL 332</td>
<td>General Ecology</td>
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<tr>
<td>CHEM 341 &amp; 341L</td>
<td>Organic Chemistry I and Organic Chemistry I Laboratory 3</td>
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<td>OR</td>
<td>Survey of Organic Chemistry and Survey of Organic Chemistry Laboratory 3</td>
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### Junior Year

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<tr>
<td>BIOL 378 &amp; 378L</td>
<td>Developmental Biology and Developmental Biology Lab 2</td>
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<td>Biometry or Sociological Statistics</td>
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<td>College Physics I</td>
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### Spring

| BIOL 415 | Genomics 2 | 4 |
| BIOL 416 or BIOL 418 | Ecological Genomics or Systems Biology | 3-4 |
| BMB 301 | Biochemistry | 3 |
| PHYS 212 | College Physics II | 4 |
| General Elective | 3-4 |
| Credits | 17-20 |

### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 410 or BIOL 480</td>
<td>Molecular Biology Techniques 2 or Senior Capstone Seminar</td>
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<tr>
<td>BIOL 442 &amp; 442L</td>
<td>Physiology of Organs and Systems and Physiology of Organs and Systems Laboratory 2</td>
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<td>3-4</td>
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<tr>
<td>Credits</td>
<td>17-19</td>
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### Spring

| BIOL 410 or BIOL 480 | Molecular Biology Techniques 2 or Senior Capstone Seminar | 3-4 |
The B.S. with Major in Molecular and Integrative Biology with the Basic Life Science option is designed for students interested in integrating knowledge across levels of biological organization and provides a strong foundation for students planning to continue their studies in medical science, graduate, or professional programs. This is one possible way to complete the degree in 4 years but there is flexibility to allow students to customize the program of study to their own needs including allowing for semesters with internships or study abroad. Students are highly encouraged to meet with their advisor to personalize their program of study.

1 = Recitations are optional but if desired should be taken at the same time as the lecture course.

2 = Students are required to take 4 upper level labs. These courses meet the upper level lab requirement.

3 = Organic chemistry requirement can be met either by taking Chem 341/L or Chem 341/L, or Chem 342/L or Chem 342/L, or BIOL 418.

The B.S. with Major in Molecular and Integrative Biology with the Enhanced Applied Life Science option is designed for students interested in integrating knowledge across levels of biological organization and who are interested in pursuing technical positions or further training in applied health science and biotechnology. This is one possible way to complete the degree in 4 years but there is flexibility to allow students to customize the program of study to their own needs including allowing for semesters with internships or study abroad. Students are highly encouraged to meet with their advisor to personalize their program of study.

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 120 Orientation to the Biology Major</td>
<td>1</td>
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<tr>
<td>BIOL 150 &amp; 150L General Biology I and General Biology I Laboratory</td>
<td>4</td>
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<tr>
<td>CHEM 121 &amp; 121L General Chemistry I and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
<td>MATH 146 or MATH 165 Applied Calculus I or Calculus I</td>
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<td><strong>Credits</strong></td>
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### Spring

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<tr>
<td>BIOL 151 &amp; 151L General Biology II and General Biology II Laboratory</td>
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<td>CHEM 122 &amp; 122L General Chemistry II and General Chemistry II Laboratory</td>
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<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
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<tr>
<td><strong>Credits</strong></td>
<td>17-18</td>
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### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 315 &amp; 315R Genetics and Genetics Recitation</td>
<td>4</td>
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<tr>
<td>BIOL 332 General Ecology</td>
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<tr>
<td>CHEM 341 &amp; 341L Organic Chemistry I and Organic Chemistry I Laboratory</td>
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<tr>
<td>OR</td>
<td>5</td>
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<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
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<td><strong>Credits</strong></td>
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### Junior Year

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<tr>
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<tbody>
<tr>
<td>BIOL 312 Evolution &amp; 312R Evolution Recitation</td>
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<td>BIOL 341 Cell Biology &amp; 341L and Cell Biol Lab</td>
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<td>CHEM 342 &amp; 342L Organic Chemistry II and Organic Chemistry II Laboratory</td>
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<td>OR</td>
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<td><strong>Credits</strong></td>
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### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 415 Genomics &amp; 415R Genomics</td>
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<tr>
<td>BIOL 416 &amp; 416R Ecological Genomics &amp; Systems Biology</td>
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<tr>
<td>BMB 301 Biochemistry</td>
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<tr>
<td>MBIO 302 General Microbiology Lecture &amp; 302L and General Microbiology Laboratory</td>
<td>4</td>
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<tr>
<td>PHYS 211 College Physics I</td>
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<td><strong>Essential Studies Elective</strong></td>
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<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 410 &amp; 410R Molecular Biology Techniques &amp; Senior Capstone Seminar</td>
<td>3-4</td>
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<tr>
<td>BIOL 442 Physiology of Organs and Systems &amp; 442L and Physiology of Organs and Systems Laboratory</td>
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<td>BMB 401 Biochemistry of Proteins and Information Flow</td>
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<td>BMB 403 Advanced Biochemistry Laboratory</td>
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<td>MBIO 328 Introduction to Immunology</td>
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<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
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<tr>
<td><strong>Credits</strong></td>
<td>18-20</td>
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<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 410 &amp; 410R Molecular Biology Techniques &amp; Senior Capstone Seminar</td>
<td>3-4</td>
</tr>
<tr>
<td>BIOL 416 &amp; 416R Ecological Genomics &amp; Systems Biology</td>
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<td>Biology Elective</td>
<td>3-4</td>
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<td>General Elective</td>
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<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td>15-19</td>
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</table>

### Total Credits

147-161
1 = Recitations are optional but if desired should be taken at the same time as the lecture course.

2 = Students are required to take 4 upper level labs. These courses meet the upper level lab requirement.

3 = Organic chemistry requirement can be met either by taking Chem 341/L 342/L, Chem 341/L BMB 301, or Chem 340/L. Students considering medical school are encouraged to take Chem 341/341L, Chem 342/342L, and BMB 301 because some medical schools require or prefer this combination.

4 = Students in this major interested in a career in the biotechnology industry are encouraged to consider taking entrepreneurship courses including ENTR 200 and ENTR 201 at a minimum. Students are also strongly encouraged to gain research experience which could be done for credit through BIOL 492.

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

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### B.S. with Major in Biology - Pre-Health Sciences Emphasis

#### Freshman Year

**Fall**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
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</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
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<td>&amp; 150L</td>
<td>General Biology I Laboratory</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
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<td>&amp; 121L</td>
<td>General Chemistry I Laboratory</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
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<td>or MATH 165</td>
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**Credits** 15-16

**Spring**

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<td>&amp; 122L</td>
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<td>ENGL 130</td>
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<td>COMM 110</td>
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**Essential Studies Elective** 3-4

**Credits** 17-18

#### Sophomore Year

**Fall**

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<tr>
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<td>BIOL 332</td>
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<td>CHEM 341</td>
<td>Organic Chemistry I</td>
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<td>&amp; 341L</td>
<td>and Organic Chemistry I Laboratory 3</td>
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**General Electives**

**Essential Studies Elective** 3-4

**General Electives** 3-4

**Credits** 23-25

**Spring**

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<td>BIOL 341</td>
<td>Cell Biology</td>
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<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
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**Credits** 138-160

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### Chemistry

#### B.S. in Chemistry - ACS Degree

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### B.S. with Major in Chemistry - Biochemistry Option

### B.S. with Major in Chemistry - Physical Science Option

### B.S. in Chemistry - ACS Degree

#### Freshman Year

<table>
<thead>
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<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts</td>
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<td>CHEM 221L</td>
<td>Fundamentals of Chemistry Laboratory</td>
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<td>MATH 165</td>
<td>Calculus I</td>
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<td>CHEM 221</td>
<td>Fundamentals of Chemistry Laboratory</td>
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<td>MATH 165</td>
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#### Sophomore Year

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<td>Analytical Chemistry Laboratory</td>
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<td>CHEM 341</td>
<td>Organic Chemistry I</td>
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<td>CHEM 341L</td>
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<td>PHYS 251</td>
<td>University Physics I</td>
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<tr>
<td>Spring</td>
<td>CHEM 342</td>
<td>Organic Chemistry II</td>
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<td>Essential Studies &amp; Other Electives</td>
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#### Junior Year

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<tbody>
<tr>
<td>Fall</td>
<td>CHEM 454</td>
<td>Inorganic Chemistry II</td>
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<td></td>
<td>CHEM 454L</td>
<td>Inorganic Chemistry II Laboratory</td>
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<td></td>
<td>CHEM 466</td>
<td>Fundamentals of Physical and Biophysical</td>
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<td></td>
<td>CHEM 443</td>
<td>Instrumental Analysis III - Chromatography/Mass</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>Spectroscopy</td>
<td></td>
</tr>
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<td><strong>16</strong></td>
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</tr>
<tr>
<td>Spring</td>
<td>CHEM 471</td>
<td>Quantum Mechanics &amp; Spectroscopy</td>
<td>3</td>
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<td>CHEM 471R</td>
<td>Quantum Mechanics &amp; Spectroscopy Recitation</td>
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<td>CHEM 441</td>
<td>Instrumental Analysis I - Spectroscopy</td>
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<td></td>
<td>BMB 301</td>
<td>Biochemistry</td>
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#### Senior Year

<table>
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<tr>
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<td>Spectroscopy and Structure</td>
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<td>CHEM 462</td>
<td>Physical Chemistry Laboratory</td>
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<td></td>
<td>CHEM 492</td>
<td>Senior Research</td>
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<tr>
<td>Spring</td>
<td>CHEM 442</td>
<td>Instrumental Analysis II - Electrochemistry ³</td>
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<tr>
<td></td>
<td>CHEM 488</td>
<td>Undergraduate Seminar</td>
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<td></td>
<td>CHEM 492</td>
<td>Senior Research</td>
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</tr>
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<td></td>
<td>Electives ⁴</td>
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<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td></td>
<td><strong>Total Credits</strong></td>
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</table>

REQUIRED 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings).

II. The Following Curriculum:

Major Requirements - 51 hours of Chemistry including the courses listed above.

FOOTNOTES:

1 = If a student is not ready for Math 165, the math sequence may be moved back one semester and Math 107 (also Math 103, if needed) should be taken in the first semester.

2 = Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.

3 = Chem 44x (441, 442 and 443) courses are offered within a regular, two-year cycle. Students can take Chem 44x courses in any order and that order may differ from one shown above. To complete the degree in 4 years, students must start their Junior Year by taking the first available Chem 44x course of the cycle.

4 = Graduate level courses in chemistry may be taken as electives. Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### B.S. with Major in Chemistry - Biochemistry Option

#### Freshman Year

<table>
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<td>CHEM 101</td>
<td>Orientation to Chemistry</td>
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<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<td></td>
<td>BIOL 150</td>
<td>General Biology I ¹</td>
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<td>BIOL 150L</td>
<td>General Biology I ¹ Laboratory</td>
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<tr>
<td>Spring</td>
<td>CHEM 122</td>
<td>General Chemistry II</td>
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<td>CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<td></td>
<td>MATH 146</td>
<td>Applied Calculus I ²</td>
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<td>BIOL 151</td>
<td>General Biology II</td>
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#### Sophomore Year

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<tbody>
<tr>
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<td>Analytical Chemistry</td>
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<td>CHEM 456</td>
<td>Organic Chemistry I</td>
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<td></td>
<td>CHEM 458</td>
<td>Problem Solving in Organic Chemistry I</td>
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<td>Electives ⁵</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Spring</td>
<td>CHEM 459</td>
<td>Senior Research</td>
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<td>Electives ⁵</td>
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<td><strong>Total Credits</strong></td>
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</table>
PHYS 211 College Physics I 4
Essential Studies Electives 3

Spring
CHEM 342 Organic Chemistry II 3
CHEM 342L Organic Chemistry II Laboratory 1
CHEM 362 Problem Solving in Organic Chemistry II 1
PHYS 212 College Physics II 4
Essential Studies Electives 3

Credits 16

Junior Year
Fall
Level II Language 4
Electives 3

Credits 15

Spring
CHEM 342 Organic Chemistry II 3
CHEM 342L Organic Chemistry II Laboratory 1
CHEM 362 Problem Solving in Organic Chemistry II 1
PHYS 212 College Physics II 4
Essential Studies Electives 3

Credits 15

Sophomore Year
Fall
CHEM 333 Analytical Chemistry 3
CHEM 333L Analytical Chemistry Laboratory 1
CHEM 341 Organic Chemistry I 3
CHEM 341L Organic Chemistry I Laboratory 1
CHEM 361 Problem Solving in Organic Chemistry I 1
PHYS 251 University Physics I 4
MATH 265 Calculus III 4

Credits 15

Spring
CHEM 333 Analytical Chemistry 3
CHEM 333L Analytical Chemistry Laboratory 1
CHEM 341 Organic Chemistry I 3
CHEM 341L Organic Chemistry I Laboratory 1
CHEM 361 Problem Solving in Organic Chemistry I 1
PHYS 251 University Physics I 4
MATH 265 Calculus III 4

Credits 15

B.S. with Major in Chemistry - Physical Science Option

Freshman Year
Fall
CHEM 101 Orientation to Chemistry 1
CHEM 121 General Chemistry I 3

Credits 4

CHEM 121L General Chemistry I Laboratory 1
ENGL 110 College Composition I 3
MATH 165 Calculus I 4
Essential Studies Electives 4

Credits 16

Spring
CHEM 122 General Chemistry II 3
CHEM 122L General Chemistry II Laboratory 1
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 166 Calculus II 4
Essential Studies Electives 4

Credits 16

Junior Year
Fall
CHEM 333 Analytical Chemistry 3
CHEM 333L Analytical Chemistry Laboratory 1
CHEM 341 Organic Chemistry I 3
CHEM 341L Organic Chemistry I Laboratory 1
CHEM 361 Problem Solving in Organic Chemistry I 1
PHYS 251 University Physics I 4
MATH 265 Calculus III 4

Credits 15

Spring
CHEM 333 Analytical Chemistry 3
CHEM 333L Analytical Chemistry Laboratory 1
CHEM 341 Organic Chemistry I 3
CHEM 341L Organic Chemistry I Laboratory 1
CHEM 361 Problem Solving in Organic Chemistry I 1
PHYS 251 University Physics I 4
MATH 265 Calculus III 4

Credits 15

Senior Year
Fall
CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry 3
CHEM 466 Fundamentals of Physical and Biophysical Chemistry 4
Level II Language 4
Electives 2

Credits 16

Spring
CHEM 471 Quantum Mechanics & Spectroscopy 3
CHEM 471R Quantum Mechanics & Spectroscopy Recitation 1
CHEM 441 Instrumental Analysis I - Spectroscopy 2
Level II Language 4
Electives 4

Credits 16

Junior Year
Fall
CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry 3

Credits 6

Spring
CHEM 471 Quantum Mechanics & Spectroscopy 3
CHEM 471R Quantum Mechanics & Spectroscopy Recitation 1
CHEM 441 Instrumental Analysis I - Spectroscopy 2
Level II Language 4
Electives 4

Credits 16

Senior Year
Fall
CHEM 462 Physical Chemistry Laboratory 3

Credits 12

Spring
CHEM 444 Instrumental Analysis II - Electrochemistry 3
Electives 4

Credits 13

Total Credits 125

REQUIRED 125 credits (36 of which must be numbered 300 or above and 60 of which must be from a 4-year institution) including:
I. Essential Studies Requirements (see University ES guidelines and course listings).
II. The Following Curriculum:
Major Requirements - 37 hours of Chemistry including the courses listed above.
FOOTNOTES:
1 = Biology 150 and 151 can be taken in the sophomore year. They are prerequisite to other required biology courses.
2 = If a student is not ready for Math 146, Math 103 should be taken in the first semester. If a student would like the option to change into the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option at a later date, be aware that Math 165, 166, and 265 are required. If a student who begins either the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option wishes to change to the Biochemistry Option, Math 165 will substitute for Math 146.
3 = Electives must include 3 credit hours from Cell Biology (Bio 341), Genetics (Bio 315), or Microbiology (MBio 302L). Other suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
Communication

B.A. with Major in Communication

Freshman Year

Fall

<table>
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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>COMM 102 Communication and the Human Community</td>
<td>3</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>COMM 103 Information, Technology and Social Change</td>
<td>3</td>
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<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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Sophomore Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMM 110 Fundamentals of Public Speaking or COMM 200 Introduction to Media Writing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 201 Visual Communication or COMM 212 Interpersonal Communication or COMM 300 Communication and Society or COMM 303 Principles of Public Relations</td>
<td>3</td>
</tr>
<tr>
<td>Electives/Essential Studies</td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMM 200 Introduction to Media Writing or COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>COMM 212 Interpersonal Communication or COMM 201 Visual Communication or COMM 300 Communication and Society or COMM 303 Principles of Public Relations</td>
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Junior Year

Fall

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Spring

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Senior Year

Fall

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>COMM 410 Research Methods in Communication (or other available ES Capstone course)</td>
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Communication Sciences and Disorders

B.A. with Major in Communication Sciences and Disorders

Freshman Year

Fall

<table>
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<th>Credits</th>
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<tr>
<td>MATH 103 College Algebra</td>
<td>3</td>
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<tr>
<td>BIOL 111 Concepts of Biology</td>
<td>3</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td>BIOL 111L Concepts of Biology Laboratory</td>
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<tr>
<td>PSYC 111 Introduction to Psychology</td>
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Spring

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<th>Course</th>
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<tbody>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>A course in Fine Arts</td>
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</tr>
<tr>
<td>A course in Chem or Phys</td>
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</tr>
<tr>
<td>IS 121 Introduction to American Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 209 Introduction to Linguistics</td>
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Sophomore Year

Fall

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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSD 232 Survey of Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 231 Anatomy and Physiology of the Speech and Hearing Mechanism</td>
<td>4</td>
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<tr>
<td>PSYC 241 Introduction to Statistics</td>
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<tr>
<td>CSD 223 Phonetics</td>
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Spring

<table>
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<tbody>
<tr>
<td>CSD 340 Normal Language Structure</td>
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<td>PSYC 250 Developmental Psychology</td>
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<tr>
<td>An elective</td>
<td>3</td>
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<tr>
<td>A course in Teaching &amp; Learning</td>
<td>3</td>
</tr>
<tr>
<td>CSD 235 Speech and Hearing Science</td>
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Junior Year

Fall

<table>
<thead>
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>A course either in Fine Arts or Humanities</td>
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<tr>
<td>CSD 343 Language Development</td>
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<td>CSD 343L Language Development Laboratory</td>
<td>2</td>
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<tr>
<td>CSD 431 Introduction to Audiology</td>
<td>3</td>
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<tr>
<td>PSYC 270 Abnormal Psychology</td>
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Computer Science

B.A. with Major in Computer Science

B.S. in Computer Science

B.A. with Major in Computer Science

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CSCI 160: Computer Science I</td>
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<tr>
<td>MATH 103 or MATH 107: College Algebra</td>
<td>3</td>
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<tr>
<td>ENGL 110: College Composition I</td>
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| Credits                                |         |

Spring

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<tbody>
<tr>
<td>CSCI 161: Computer Science II</td>
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<td>ENGL 130: Composition II: Writing</td>
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<tr>
<td>MATH 208: Discrete Mathematics</td>
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| Credits                                |         |

Sophomore Year

Fall

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<tbody>
<tr>
<td>CSCI 242: Algorithms and Data Structures</td>
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<td>EE 201: Introduction to Digital</td>
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<td>Electronics</td>
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<td>EE 202: Electrical Engineering</td>
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<td>Laboratory</td>
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<tr>
<td>E.S. Fine Arts Elective</td>
<td>3</td>
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<tr>
<td>COMM 110: Fundamentals of Public</td>
<td>3</td>
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<tr>
<td>Speaking</td>
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| Credits                                |         |

Senior Year

Fall

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>CSCI 451: Operating Systems I</td>
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<tr>
<td>CSCI 461: Principles of Translation</td>
<td>3</td>
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<tr>
<td>CSCI 492: Senior Project I</td>
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| Credits                                |         |

Spring

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<tbody>
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<td>CSCI 493: Senior Project II</td>
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| Credits                                |         |

Junior Year

Fall

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<th>Course</th>
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<tbody>
<tr>
<td>CSCI 465: Organization of Programming</td>
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<tr>
<td>CSCI 490: Computer Architecture</td>
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| Credits                                |         |

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSCI 491: Operating Systems II</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 492: Senior Project I</td>
<td>2</td>
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</tbody>
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| Credits                                |         |

B.S. in Computer Science

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 160: Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 107 or MATH 108: Precalculus</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110: College Composition I</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits                                |         |

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 161: Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130: Composition II: Writing</td>
<td>3</td>
</tr>
<tr>
<td>for Public Audiences</td>
<td></td>
</tr>
<tr>
<td>MATH 208: Discrete Mathematics</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits                                |         |

Sophomore Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 242: Algorithms and Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>EE 201: Introduction to Digital</td>
<td>2</td>
</tr>
<tr>
<td>Electronics</td>
<td></td>
</tr>
<tr>
<td>EE 202: Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Laboratory</td>
<td></td>
</tr>
<tr>
<td>E.S. Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110: Fundamentals of Public</td>
<td>3</td>
</tr>
<tr>
<td>Speaking</td>
<td></td>
</tr>
</tbody>
</table>

| Credits                                |         |

Senior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 242: Algorithms and Data Structures</td>
<td>3</td>
</tr>
</tbody>
</table>
Criminal Justice Studies

B.S. in Criminal Justice Studies

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>SOC 253</td>
<td>Delinquency and Juvenile Justice</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>(in Fine Arts with Global or United States Diversity)</td>
<td></td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>(in Math, Science, Technology--4 credits if taken with lab)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ 210</td>
<td>Introduction to Policing</td>
</tr>
<tr>
<td>SJ 270</td>
<td>Introduction to Corrections</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>(in Social Sciences with Global or United States Diversity--if not previously taken)</td>
<td></td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
</tbody>
</table>

| Credits | 15 |

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course in Concentration Area</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>(in Fine Arts or Humanities with Global or United States Diversity--if not previously taken)</td>
<td></td>
</tr>
<tr>
<td>Course in Concentration Area</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>4</td>
</tr>
<tr>
<td>(a Math, Science, Technology Lab Course)</td>
<td></td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 16 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course in Concentration Area</td>
<td>3</td>
</tr>
<tr>
<td>CJ 330</td>
<td>Criminological Theory</td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
</tr>
<tr>
<td>General Electives</td>
<td>4</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 18 |

**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Course in Concentration Area</td>
<td>3</td>
</tr>
<tr>
<td>CJ 341</td>
<td>Criminal Law</td>
</tr>
<tr>
<td>Course in Concentration Area</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 15 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ Elective (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 342</td>
<td>Criminal Procedure</td>
</tr>
<tr>
<td>Course in Concentration Area (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 15 |

**Senior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ Electives (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 460</td>
<td>Philosophy of Law</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 15 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ Electives (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 401</td>
<td>Administration of Criminal Justice Systems</td>
</tr>
<tr>
<td>Course in Concentration Area (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td>General Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 15 |

**Total Credits** | 125 |
This plan of study represents just one way in which a student can complete the requirements for the Bachelor of Science in Criminal Justice Studies within four years. Because of the large number of ways to complete the degree requirements for this major, students should always consult their adviser for assistance regarding their specific plan of study. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

## Economics

### B.A. with Major in Economics

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECON 201 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 103 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Arts and Humanities (FA)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 146 Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ECON 202 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Arts and Humanities (HUM)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies/Special Emphasis: United States Diversity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECON 210 Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ECON 308 Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Social Science (Non-economics)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>ECON 303 Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ECON 309 Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Lab Science</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Essential Studies/Special Emphasis: Advanced Communication</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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#### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECON 410 Empirical Methods in Economics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Global Diversity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives in Economics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>Electives in Economics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>ECON 338 International Economics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
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</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Electives in Economics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
<td>12</td>
</tr>
<tr>
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<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
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<tr>
<td>Spring</td>
<td>Open Electives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Capstone</td>
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</tbody>
</table>

### Electives in Economics

<table>
<thead>
<tr>
<th>Credits</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Credits</td>
<td>125</td>
</tr>
</tbody>
</table>

In place of Economics Electives, interested students may select electives from Option B, which includes math classes for the quantitative option.

Students must pay attention to the number of credits at courses numbered 300 or above for graduation.

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

## English

### B.A. with Major in English

### B.A. with Major in English - Teacher Licensure

### B.A. with Major in English

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td>Language 101</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>The English major requires Level IV proficiency in a language other than English. Students may meet this requirement through coursework or equivalent language testing. We recommend starting early on the language requirement, though students may opt to begin the sequence after the Freshman year.</td>
<td></td>
</tr>
<tr>
<td>Second Semester</td>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives/Essential Studies</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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</table>

#### Second Semester

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language 102</td>
<td>Language 102</td>
<td>4</td>
</tr>
<tr>
<td>Electives/Essential Studies</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td>ENGL 271 Reading and Writing about Texts</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGL 301 Survey of English Literature I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGL 303 or ENGL 304 Survey of American Literature</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Students are required to take one of the two-course 300-level surveys. While we recommend fulfilling that requirement early, students may opt to take these courses later in their career.</td>
<td></td>
</tr>
<tr>
<td>Second Semester</td>
<td>Language 201</td>
<td>4</td>
</tr>
<tr>
<td>Electives/Essential Studies</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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#### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td>ENGL 302 Survey of English Literature II</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 304 Survey of American Literature</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Language 202</td>
<td>Language 202</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 272 Introduction to Literary Criticism</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives/Essential Studies</td>
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</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Year</td>
<td>Electives/Essential Studies</td>
<td>9</td>
</tr>
<tr>
<td>English Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>One English elective needs to satisfy the historical requirement for the major and focus on the literature of an earlier historical period</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives/Essential Studies</td>
<td>9</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>
Forensic Science

B.S. with Major in Forensic Science Evidence Analyst Track

B.S with Major in Forensic Science Evidence Technician Track

B.S. with Major in Forensic Science Evidence Analyst Track

B.S with Major in Forensic Science Evidence Technician Track

The English major is flexible and this plan of study offers only one possible path through the major. One of the advantages of a liberal arts education is the ability for students to take courses in a wide variety of areas, and we encourage English majors to explore other fields. All students should meet with their advisers regularly to chart a personalized course of study that best fits with their interests and needs.** Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>ES Courses</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 341L</td>
<td>Organic Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 342</td>
<td>Organic Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 342L</td>
<td>Organic Chemistry II Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 210</td>
<td>Introduction to Policing</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 161/162</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Statistics course</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

If Chemistry double major see forensic science advisor

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Year</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>ANTH 345</td>
<td>Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 346</td>
<td>Analysis of Forensic Evidence</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 315</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 320</td>
<td>Forensic Biology</td>
<td>3</td>
</tr>
<tr>
<td>BMB 301</td>
<td>Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 333L</td>
<td>Analytical Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Program Electives and/or ES Courses</td>
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<td>11</td>
</tr>
</tbody>
</table>

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 333L</td>
<td>Analytical Chemistry Laboratory</td>
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**Senior Year**

<table>
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<tbody>
<tr>
<td>CJ 352</td>
<td>Criminal Investigation</td>
<td>3</td>
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<td>CJ 342</td>
<td>Criminal Procedure</td>
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<td>ES Courses (Capstone)</td>
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**B.S. with Major in Forensic Science Evidence Technician Track**

**Freshman Year**

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<tbody>
<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>3</td>
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<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
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<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
<td>3</td>
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<tr>
<td>BIOL 151L</td>
<td>General Biology II Laboratory</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>3</td>
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<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
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</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
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<tr>
<td>CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<thead>
<tr>
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<tbody>
<tr>
<td>Statistics Course (typically SOC 326 or BIOL 470)</td>
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<tr>
<td>Program Electives</td>
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**Junior Year**

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<tbody>
<tr>
<td>ANTH 346</td>
<td>Analysis of Forensic Evidence</td>
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<tr>
<td>ANTH 345</td>
<td>Forensic Science</td>
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<td>PHYS 161</td>
<td>Introductory College Physics I</td>
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<td>PHYS 162</td>
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**B.S. with Major in Geography - Community and Urban Development Emphasis**

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<thead>
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<tr>
<td>GEOG 151</td>
<td>Human Geography</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>Electives</td>
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**B.S. with Major in Geography - Environmental Geography Emphasis**

**B.S. with Major in Geography - Geographic Education Emphasis - Teacher Licensure**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>GEOG 121</td>
<td>Global Physical Environment</td>
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<tr>
<td>GEOG 121L</td>
<td>Global Physical Environment Laboratory</td>
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</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>(from Math, Science and Technology--other than Geography)</td>
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</tr>
<tr>
<td>Essential Studies Elective</td>
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<td>3</td>
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<tr>
<td>(from Fine Arts and Humanities)</td>
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<td>3</td>
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<tr>
<td>Elective</td>
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<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences)</td>
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**Geography**

**B.S. with Major in Geography - Community and Urban Development Emphasis**

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<tr>
<td>GEOG 151</td>
<td>Human Geography</td>
<td>3</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td>Electives</td>
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<tr>
<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences--at least 3 credits must be approved for Social Sciences Essential Studies)</td>
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**B.S. with Major in Geography - Environmental Geography Emphasis**

**B.S. with Major in Geography - Geographic Education Emphasis - Teacher Licensure**

**B.S. with Major in Geography - Community and Urban Development Emphasis**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 151</td>
<td>Human Geography</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td>Electives</td>
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<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences--at least 3 credits must be approved for Social Sciences Essential Studies)</td>
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**Second Semester**

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</tr>
<tr>
<td>GEOG 121L</td>
<td>Global Physical Environment Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
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<td>3</td>
</tr>
<tr>
<td>(from Math, Science and Technology--other than Geography)</td>
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<tr>
<td>Essential Studies Elective</td>
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<tr>
<td>(from Fine Arts and Humanities)</td>
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<tr>
<td>Elective</td>
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<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences)</td>
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</table>
Sophomore Year
First Semester
GEOG 262 Geography of North America I or any approved Essential Studies course that carries U.S. Diversity (U) credit 3
ENGL 130 Composition II: Writing for Public Audiences 3
Essential Studies Elective 3
(from Fine Arts and Humanities)
Elective 3
(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences)
Elective 3
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 15
Second Semester
Electives 13
(from Geography or another department—see your advisor for a list of recommended courses)
Essential Studies Elective 3
(from Fine Arts and Humanities)
Credits 16
Junior Year
First Semester
GEOG 322 Environmental Hazards 3
or GEOG 374 Environmental Remote Sensing
GEOG 352 Economic Geography 3
GEOG 377 Quantitative Applications in Geography 2
GEOG 377L Spatial Analysis Laboratory 1
GEOG 471 Cartography and Visualization 2
GEOG 471L Cartography and Visualization Laboratory 1
Elective 3
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 16
Second Semester
GEOG 457 Urban Geography and Planning 3
GEOG 474 Introduction to Geographic Information Systems (GIS) 2
GEOG 474L GIS Laboratory 1
GEOG 459 Population Geography 3
or GEOG 463 Regional Geography
Electives 6
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 15
Senior Year
First Semester
GEOG 458 Community Development 3
Electives 15
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 18
Second Semester
GEOG 454 Conservation and Sustainable Use of Natural Resources 3
Electives 12
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 15
Total Credits 125

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### B.S. with Major in Geography - Environmental Geography Emphasis

**Freshman Year**
Fall
GEOG 121 Global Physical Environment 3
GEOG 121L Global Physical Environment Laboratory 1
ENGL 110 College Composition I 3
COMM 110 Fundamentals of Public Speaking 3
Electives 6
(from Atmospheric Science, Biology, Chemistry, Computer Science, Civil Engineering, Geology and Geological Engineering, Math and/or Physics)
Credits 16

**Spring**
GEOG 151 Human Geography 3
GEOG 161 World Regional Geography 3
Essential Studies Elective 3
(from Social Sciences—other than Geography)
Essential Studies Elective 3
(from Fine Arts and Humanities)
Elective 3
(from Atmospheric Science, Biology, Chemistry, Computer Science, Civil Engineering, Geology and Geological Engineering, Math and/or Physics)
Credits 15

**Sophomore Year**
Fall
GEOG 262 Geography of North America I or any approved Essential Studies course that carries U.S. Diversity (U) credit 3
Elective 3
(from Atmospheric Science, Biology, Chemistry, Computer Science, Civil Engineering, Geology and Geological Engineering, Math and/or Physics)
ENGL 130 Composition II: Writing for Public Audiences 3
Essential Studies Elective 3
(from Fine Arts and Humanities)
Elective 3
(from Geography or another department—see your advisor for a list of recommended courses)
Credits 15

**Spring**
Electives 13
(from Geography or another department—see your advisor for a list of recommended courses)
Essential Studies Elective 3
(from Fine Arts and Humanities)
Credits 16

**Junior Year**
Fall
GEOG 471 Cartography and Visualization 2
GEOG 471L Cartography and Visualization Laboratory 1
GEOG 472 Environmental Hazards 3
or GEOG 421 Selected Topics in Physical Geography
GEOG 374 Environmental Remote Sensing 2
or GEOG 352 Economic Geography
GEOG 374L Environmental Remote Sensing Laboratory Only if taking GEOG 374 1
Electives 6

**Total Credits:** 125
<table>
<thead>
<tr>
<th>Semester</th>
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<td></td>
<td>GEOG 334</td>
<td>Climatology</td>
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<tr>
<td></td>
<td>or GEOG 421</td>
<td>or Selected Topics in Physical Geography</td>
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<tr>
<td></td>
<td>GEOG 475</td>
<td>Digital Image Processing or Urban Geography and Planning</td>
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<td>Senior Year</td>
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<td></td>
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<tr>
<td>Fall</td>
<td>GEOG 377</td>
<td>Quantitative Applications in Geography</td>
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<td>GEOG 377L</td>
<td>Spatial Analysis Laboratory</td>
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<tr>
<td>First Semester</td>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
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<td></td>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
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<tr>
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<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
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<td>GEOG 386</td>
<td>Geography Education Field Placement</td>
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<td>GEOG 419</td>
<td>Methods and Materials of Teaching Middle and Secondary School in Geographic Education</td>
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<td>T&amp;L 432</td>
<td>Learning Environments</td>
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<td>T&amp;L 486</td>
<td>Field Experience</td>
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**Elective (from the list of approved Geography electives for Education Emphasis--see your advisor for recommendations)**

**Essential Studies Elective (from Math, Science and Technology)**

**Essential Studies Elective (from Fine Arts and Humanities)**

**Senior Year**

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>T&amp;L 487</td>
<td>3</td>
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<tr>
<td>T&amp;L 488</td>
<td>3</td>
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<td>GEOG 454</td>
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**Total Credits**: 125-131

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**B.S. with Major in Geography - Geographic Education Emphasis - Teacher Licensure**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
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</thead>
<tbody>
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<td>First Semester</td>
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<tr>
<td>GEOG 151</td>
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<td>GEOG 161</td>
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<td>ENGL 110</td>
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<td>COMM 110</td>
<td>3</td>
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<tr>
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<tr>
<td>(from Social Sciences--other than Geography)</td>
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<tr>
<td><strong>Note:</strong> Geography students seeking secondary licensure must have a geography education adviser in the Geography Department and an adviser in the Department of Teaching and Learning.</td>
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<td>Credits</td>
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<td>GEOG 121</td>
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<td>GEOG 271</td>
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<thead>
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<tbody>
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<td>GEOG 352</td>
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<td>(from Math, Science and Technology)</td>
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<td>(from Fine Arts and Humanities)</td>
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Graphic Design and New Art Media

B.F.A. with Major in Graphic Design and New Art Media

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
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<tr>
<td>ART 114 Visual Persuasion</td>
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<tr>
<td>ART 210 History of Art I</td>
<td>3</td>
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<tr>
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<td>3</td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ART 130 Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 211 History of Art II</td>
<td>3</td>
</tr>
<tr>
<td>ART 273 Graphic Design Foundations</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Lab Elective</td>
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<tr>
<td>Essential Studies Elective</td>
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<tr>
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Sophomore Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ART 230 Drawing II</td>
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<tr>
<td>ART 240 Printmaking I</td>
<td>3</td>
</tr>
<tr>
<td>ART 260 Color Photography</td>
<td>3</td>
</tr>
<tr>
<td>ART 382 Typography</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
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Spring

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ART 245 Black and White Photography I</td>
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<tr>
<td>ART 272 Timebased Media I - Time Design and Digital Media</td>
<td>3</td>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>BFA Application</td>
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<td><strong>Credits</strong></td>
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Junior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>200-300 Level Studio Art Course</td>
<td>3</td>
</tr>
<tr>
<td>400 Level Art History</td>
<td>3</td>
</tr>
<tr>
<td>ART 480 Advanced Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>ART 413 History of Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 480 Advanced Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>400 Level Graphic Design Course</td>
<td>3</td>
</tr>
<tr>
<td>ART 494 Professional Exhibition</td>
<td>3</td>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>1</td>
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<tr>
<td>Annual BFA Review</td>
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<td><strong>Credits</strong></td>
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Senior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>400 Level Art History</td>
<td>3</td>
</tr>
<tr>
<td>ART 481 Graphic Design Internship</td>
<td>3</td>
</tr>
<tr>
<td>400 Level Graphic Design Course</td>
<td>3</td>
</tr>
<tr>
<td>300-400 Level Studio Art or Art History</td>
<td>3</td>
</tr>
<tr>
<td>300-400 Level Studio Art or Art History</td>
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<tr>
<td><strong>Credits</strong></td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>300-400 Level Studio Art or Art History</td>
<td>3</td>
</tr>
<tr>
<td>ART 480 Advanced Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 498 Seminar in Art and Design Capstone</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td>BFA Art Exhibition</td>
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<tr>
<td><strong>Credits</strong></td>
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</table>

Total Credits: 125

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

History

B.A. with Major in History - Option A

B.A. with Major in History - Option A

B.A. with Major in History - Option A

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Take one class from the following selection: HIST101, HIST102, HIST103, HIST104, HIST105, HIST106</td>
<td>3</td>
</tr>
<tr>
<td>Take first semester foreign language course.</td>
<td>4</td>
</tr>
<tr>
<td>Select 3 Essential Studies&lt;sup&gt;ES&lt;/sup&gt; Courses. The History Department recommends that you speak with your adviser before registering for classes.</td>
<td>9-10</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16-17</strong></td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take two of the following: HIST101, HIST102, HIST103, HIST104, HIST105, HIST106</td>
<td>6</td>
</tr>
<tr>
<td>Take second semester foreign language class</td>
<td>4</td>
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<tr>
<td>Select 2 ES courses. The History Department recommends that you speak with your adviser before registering for classes.</td>
<td>6-7</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16-17</strong></td>
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Sophomore Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Take third semester foreign language class.</td>
<td>4</td>
</tr>
<tr>
<td>Select one ES course.</td>
<td>3-4</td>
</tr>
<tr>
<td>Take a 200 level History Course. The History Department recommends that you speak with your adviser before registering for classes.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 240 The Historian’s Craft</td>
<td>3</td>
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<tr>
<td><strong>Credits</strong></td>
<td><strong>13-14</strong></td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Take fourth semester language class.</td>
<td>4</td>
</tr>
<tr>
<td>Select two ES courses.</td>
<td>6-7</td>
</tr>
<tr>
<td>Select an elective course. The History Department recommends that you speak with your adviser before registering for classes.</td>
<td>3</td>
</tr>
<tr>
<td>Take a 200 level History course.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16-17</strong></td>
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</tbody>
</table>

Junior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take one 300 level History courses.</td>
<td>3</td>
</tr>
<tr>
<td>Take 2 ES courses.</td>
<td>7-8</td>
</tr>
<tr>
<td>Take one elective course. The History Department recommends that you speak with your adviser before registering for classes.</td>
<td>3</td>
</tr>
<tr>
<td>Take HIST347.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16-17</strong></td>
</tr>
</tbody>
</table>
Spring

Take 3 electives. The History Department recommends that you speak with your adviser before registering for classes. 9
Take two 300 or 400 level History courses. 6

Senior Year

Fall
Take one 300/400 level History course. 3
Take three electives The History Department recommends that you speak with your adviser before registering for classes. 9
HIST 440 Research Capstone 3

Credits 15

Spring
Take four electives The History Department recommends that you speak with your adviser before registering for classes. 12
Take two 300/400 level History courses. 6

Credits 18

Total Credits 125-130

The History Department recommends that you speak with your adviser before registering for classes. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.A. with Major in History - Option B

Freshman Year

Fall
Select two courses from: HIST101, HIST102, HIST103, HIST104, HIST105, HIST106 The History Department recommends that you speak with your adviser before registering for classes. 6
Take three Essential Studies <sup>ES</sup> Courses. 9-10

Credits 15-16

Spring
Select four ES courses. 12-13
Take one course from: HIST101, HIST102, HIST103, HIST104, HIST105, HIST106 The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 15-16

Sophomore Year

Fall
Take one course in minor field. 3
Select three ES courses. 9-10
HIST 240 The Historian's Craft recommends that you speak with your adviser before registering for classes. 3

Credits 15-16

Spring
Take two courses in your minor. 6
Select two ES courses. 6-7
Take one History elective The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 15-16

Junior Year

Fall
Take one History elective. 3
Take one class in your minor. 3
Select two ES courses. 6-7
Take HIST347 The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 15-16

Spring
Take two classes in minor. 6

Select two ES courses. The History Department recommends that you speak with your adviser before registering for classes. 6
Take History electives The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 18-19

Senior Year

Fall
Take one course from minor. 3
Take two History electives. 6
Take two open elective courses. 6
HIST 440 Research Capstone The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 18

Spring
Take four open electives. 11
Take one History elective. The History Department recommends that you speak with your adviser before registering for classes. 3

Credits 14

Total Credits 125-131

The History Department recommends that you speak with your adviser before registering for classes. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Honors

B.A. or B.S. in Honors

First Year

Summer Study Abroad - optional

Credits

Fall
HON 101 Inquiry in the Humanities 3
or HON 102 Inquiry in the Social Sciences
or HON 103 Inquiry in the Sciences

Only one course from HON 101, 102, or 103 is allowed.

Essential Studies requirements, Second Major requirements, or other areas of interest. 9

Optional: Honors sections of the following courses may be taken in conjunction with an Honors Inquiry course: BIOL 150L, COMM 110, ENGL 130, ENGL 226, or PSYC 111. 3

Credits 14-19

Second Year

Summer Study Abroad - optional

Credits

Fall
HON 291 Colloquium in the Humanities 1-4
or HON 292 Colloquium in Social Science
or HON 293 Colloquium in the Sciences
or HON 381 Exploring Global Diversity through Humanities
or HON 382 Exploring Global Diversity through Social Science

Essential Studies requirements, Second Major requirements, or other areas of interest. 10-12

Optional: Honors section of the one of the following courses could fulfill the Honors course requirement: BIOL 151L, COMM 110, ENGL 130, or PSYC 250. 3

Credits 14-19
Essential Studies requirements, Second Major requirements, or other areas of interest.

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HON 250</td>
<td>Sophomore Portfolio Workshop</td>
</tr>
<tr>
<td>HON 272</td>
<td>Social Science Colloquium on US Diversity</td>
</tr>
<tr>
<td>or HON 291</td>
<td>or Colloquium in the Humanities</td>
</tr>
<tr>
<td>or HON 292</td>
<td>or Colloquium in Social Science</td>
</tr>
<tr>
<td>or HON 293</td>
<td>or Colloquium in the Sciences</td>
</tr>
<tr>
<td>or HON 381</td>
<td>or Exploring Global Diversity through Humanities</td>
</tr>
<tr>
<td>or HON 382</td>
<td>or Exploring Global Diversity through Social Science</td>
</tr>
</tbody>
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Third Year

<table>
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<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HON 391</td>
<td>Advanced Colloquium in the Humanities</td>
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<tr>
<td>or HON 372</td>
<td>or Advanced Social Science Colloquium on US Diversity</td>
</tr>
<tr>
<td>or HON 392</td>
<td>or Colloquium in the Social Sciences</td>
</tr>
<tr>
<td>or HON 393</td>
<td>or Colloquium in the Sciences</td>
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Essential Studies Requirements/Second Major Requirements/Other areas of interest

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>16</td>
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</table>

Second Semester

| HON 395 | Prospectus Development | 1 |

Optional: Advanced Colloquium

Essential Studies Requirements/Second Major Requirements/Other areas of interest

<table>
<thead>
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Fourth Year

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>HON 489</td>
<td>Senior Honors Thesis</td>
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</table>

Optional: Advanced Colloquium

Second Major Requirements/Other areas of Interest

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>10-12</td>
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Second Semester

| HON 489: Senior Honors Thesis | 5-4 |
| Remaining Requirements in Second Major or Essential Studies | 9-10 |
| Other courses of interest | 6 |

<table>
<thead>
<tr>
<th>Total Credits</th>
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<tbody>
<tr>
<td>12-13</td>
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</table>

B.M. with a Major in Instrumental Performance (Even Fall Entry)

B.M. with a Major in Instrumental Performance (Odd Fall Entry)

B.M. with a Major in Instrumental Performance - Piano (Even Fall Entry)

This is an example of ONE Possible course of study but is not the only course of study that could be used to complete graduation/degree requirements in 4 years. It is essential that Honors students meet with their advisor at least once per semester to determine the best selection of courses. A student may receive a B.A. or B.S. in Honors depending on their second major and/or the field of concentration of the majority of their courses. Students may enter the Honors Program after their first or second semester, transfer students are welcome in the program. These students should visit with an Honors adviser to plan an individualized course of study. Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Instrumental Performance

B.M. with a Major in Instrumental Performance (Even Fall Entry)

B.M. with a Major in Instrumental Performance (Odd Fall Entry)

B.M. with a Major in Instrumental Performance - Piano (Even Fall Entry)
<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Freshman</td>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
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<tr>
<td></td>
<td>MUSC 155 Individual Lessons 1</td>
<td>2</td>
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<tr>
<td></td>
<td>MUSC 131 Aural Skills I</td>
<td>1</td>
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<td></td>
<td>Essential Studies Lab Science</td>
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<td></td>
<td>MUSC 154 Individual Lessons 2</td>
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<td></td>
<td>MUSC 278 Seminar for Collaborative Piano 3</td>
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<tr>
<td></td>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td>Spring</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
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<td></td>
<td>Electives</td>
<td>2</td>
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<td></td>
<td>MUSC 154 Individual Lessons</td>
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<td></td>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td></td>
<td>MUSC 134 Music Theory II</td>
<td>3</td>
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<td>Essential Studies Math/Science/Technology (Q)</td>
<td>3</td>
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<td>MUSC 135 Aural Skills II</td>
<td>1</td>
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<td></td>
<td>MUSC 155 Individual Lessons</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Sophomore</td>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
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<td></td>
<td>MUSC 256 Basic Conducting</td>
<td>2</td>
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<td></td>
<td>Essential Studies Humanities (Non-Music)</td>
<td>3</td>
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<td>MUSC 278 Seminar for Collaborative Piano</td>
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<tr>
<td></td>
<td>MUSC 230 Music Theory III</td>
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<td>MUSC 231 Aural Skills III</td>
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<td>MUSC 254 Individual Lessons</td>
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<tr>
<td>Senior Year</td>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Fall</td>
<td>MUSC 235 Aural Skills IV</td>
<td>1</td>
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<td>MUSC 234 Music Theory IV: Music Theory since 1900</td>
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<td>MUSC 254 Individual Lessons</td>
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<td>MUSC 278 Seminar for Collaborative Piano</td>
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<td>Electives</td>
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<td>MUSC 203 Music and Culture</td>
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<td>MUSC 255 Individual Lessons</td>
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<td>Essential Studies Social Science</td>
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<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
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<tr>
<td>Spring</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
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<td>MUSC 355 Individual Lessons</td>
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<td></td>
<td>MUSC 277 Chamber Music Groups</td>
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<td></td>
<td>MUSC 311 Music History Survey II</td>
<td>3</td>
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<td>MUSC 359 Junior Recital</td>
<td>1</td>
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<tr>
<td></td>
<td>MUSC 414 Piano Literature</td>
<td>3</td>
</tr>
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<td></td>
<td>Essential Studies Math/Science/Technology</td>
<td>3</td>
</tr>
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<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Fall</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
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<tr>
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<td>MUSC 355 Individual Lessons</td>
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<td>MUSC 277 Chamber Music Groups</td>
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<td>Essential Studies Social Science</td>
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<tr>
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<td>MUSC 455 Individual Lessons</td>
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<td>MUSC 278 Seminar for Collaborative Piano</td>
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<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Fall</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
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<tr>
<td></td>
<td>Essential Studies Social Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

1 = On Piano.
2 = On Secondary Instrument.
3 = Or Major Ensemble - Consult Advisor.

---

**B.M. with a Major in Instrumental Performance**

**(Odd Fall Entry)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 155 Individual Lessons 1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MUSC 131 Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Lab Science</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MUSC 154 Individual Lessons 2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 278 Seminar for Collaborative Piano 3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MUSC 154 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 134 Music Theory II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Math/Science/Technology (Q)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 135 Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 155 Individual Lessons</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Sophomore</td>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 256 Basic Conducting</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Humanities (Non-Music)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 230 Music Theory III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 231 Aural Skills III</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 254 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Senior Year</td>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Fall</td>
<td>MUSC 235 Aural Skills IV</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 234 Music Theory IV: Music Theory since 1900</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 254 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MUSC 203 Music and Culture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Social Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 355 Individual Lessons</td>
<td>4</td>
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<tr>
<td></td>
<td>MUSC 277 Chamber Music Groups</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 311 Music History Survey II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MUSC 359 Junior Recital</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MUSC 414 Piano Literature</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Math/Science/Technology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Fall</td>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Social Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

1 = On Piano.
2 = On Secondary Instrument.
3 = Or Major Ensemble - Consult Advisor.

---

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
### B.M. with a Major in Instrumental Performance - Piano (Even Fall Entry)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 131 Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 154 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 155 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

**Spring**

| Essential Studies Lab Science | 4       |
|                                 |         |

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 254 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 256 Basic Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 230 Music Theory III</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Spring**

| MUSC 278 Seminar for Collaborative Piano | 1       |
| **Total Credits**                       | 16      |

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>MUSC 231 Aural Skills III</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 255 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 278 Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 444 Applied Music Pedagogy</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Spring**

| MUSC 278 Seminar for Collaborative Piano | 1       |
| **Total Credits**                       | 17      |

### International Studies

#### B.A. with a Major in International Studies

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 161 World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171 Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>6</td>
</tr>
</tbody>
</table>

**Spring**

| HIST 102 Western Civilization II | 3       |
| **Total Credits**               | 6       |

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>POLS 220 International Politics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

| POLS 225 Comparative Politics | 3       |
| RELS 203 World Religions     | 3       |
| **Total Credits**            | 6       |

**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 362 Modern China</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

Please note the following:
1) There is a language requirement in the major, defined as Level IV proficiency plus an additional course at the 300-level. Students are encouraged to either take the placement exam or to begin fulfilling this requirement in fall semester of the freshman year.
2) There are an additional 9 hours of elective credit required to complete the major that serve as the student's area of focus. These courses should be taken in the junior and senior years, and must be approved by the program Director. The student and program Director decide upon an appropriate area of focus based on a student's interests.
3) This 4-year plan is a model and one way to complete the major. Students should work with the program Director in order to efficiently complete their courses of study.

4) A minimum of 125 credits are needed to graduate.

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

**Languages**

**B.A. with Major in Language: Chinese Studies**

**B.A. with Major in Language: Classical Studies**

**B.A. with Major in Language: German Studies**

**B.A. with Major in Language: Norwegian**

**B.A. with Major in Language: Spanish**

### B.A. with Major in Language: Chinese Studies

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 101 First Year Chinese I</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 305 Chinese Culture Through Films</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies/Electives</td>
<td>9</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Spring**

| Essential Studies/Electives | 9       |
| CHIN 102 First Year Chinese II | 4       |
| HIST 362 Modern China | 3       |
| **Credits** | **16** |

**Sophomore Year**

**Summer**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADM 318 China Then and Now</td>
<td>3</td>
</tr>
<tr>
<td>BADM 319 Business Fieldwork in Shanghai</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

**Fall**

| Essential Studies/Electives | 6       |
| CHIN 201 Second Year Chinese I | 4       |
| CHIN 405 Traditional Chinese Literature in Translation | 3       |
| **Credits** | **13** |

**Spring**

| Essential Studies/Electives | 3       |
| CHIN 202 Second Year Chinese II | 4       |
| CHIN 406 Modern Chinese Literature in Translation | 3       |
| BADM 316 Introduction to Business in China | 3       |
| **Credits** | **13** |

**Junior Year**

**Fall**

| Essential Studies/Electives | 16      |
| **Credits** | **16** |

**Spring**

| Essential Studies/Electives | 15      |
| **Credits** | **15** |

**Senior Year**

**Fall**

| Essential Studies/Electives | 15      |
| LANG 480 Capstone: Global Connections | 3       |
| **Credits** | **18** |

**Spring**

| Essential Studies/Electives | 12      |
| **Credits** | **12** |

**Total Credits** | **125**

11 other classes offered in Languages and other departments can be substituted. This is only an example. It is highly recommended that any student interested in a Chinese Studies major see a faculty member for an individualized plan. This is also true for those students who start the major after their Freshman year. Students must complete all Essential Studies requirements and all departmental elective requirements to graduate.

### B.A. with Major in Language: Classical Studies

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101 Western Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies/Electives</td>
<td>13</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Spring**

| Essential Studies/Electives | 13      |
| CLAS 185 Introduction to Classical Mythology | 3       |
| **Credits** | **16** |

**Sophomore Year**

**Fall**

| Essential Studies/Electives | 9       |
| CLAS 101 First Year Latin I | 4       |
| CLAS 211 Masterpieces Greek and Roman Literature in Translation | 3       |
| **Credits** | **16** |

**Spring**

| Essential Studies/Electives | 8       |
| CLAS 102 First Year Latin II | 4       |
| PHIL 300 Ancient Philosophy | 3       |
| **Credits** | **15** |

**Junior Year**

**Fall**

| Essential Studies/Electives | 9       |
| CLAS 201 Second Year Latin I | 4       |
| HIST 343 Ancient Greece | 3       |
| **Credits** | **16** |

**Spring**

| Essential Studies/Electives | 8       |
| CLAS 202 Second Year Latin II | 4       |
| HIST 344 Ancient Rome | 3       |
| **Credits** | **15** |

**Senior Year**

**Fall**

| Essential Studies/Electives | 10      |
| LANG 480 Capstone: Global Connections | 3       |
| CLAS 301 Latin Prose | 3       |
| **Credits** | **16** |

**Spring**

| Essential Studies/Electives | 12      |
| CLAS 364 Special Topics in Classical Literature | 3       |
| **Credits** | **15** |

**Total Credits** | **125**

This is only an example. It is highly recommended that any student interested in a Classical Studies major see a faculty member for an individualized plan. This is also true for those students who start the major after their Freshman year.
year. Students must complete all Essential Studies requirements and all departmental elective requirements to graduate.

### B.A. with Major in Language: French

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 101 First Year French I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Essential Studies/Electives**: 12

**Spring**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 102 First Year French II</td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 201 Second Year French I</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 202 Second Year French II</td>
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</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 301 Third Year French I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Essential Studies/Electives**: 10

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 305 French Conversation and Culture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or FREN 307 or FREN 413</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 302 Third Year French II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or FREN 307 or FREN 413</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or FREN 306 French Conversation and Culture II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or FREN 307 or FREN 413</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or FREN 371 or FREN 372 or FREN 373 or FREN 491</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Studies in European Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Studies in African, Asian, Caribbean, and/or Polynesian Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or North American Francophone Cultures through Literature and Film</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Seminar in French and Francophone Studies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 391 A Social and Cultural History of Québec</td>
<td>3</td>
</tr>
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</table>

**Essential Studies/Electives**: 10

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 371 Studies in European Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Studies in African, Asian, Caribbean, and/or Polynesian Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or North American Francophone Cultures through Literature and Film</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Seminar in French and Francophone Studies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

#### Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 372 Studies in African, Asian, Caribbean, and/or Polynesian Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>or FREN 371 or FREN 373 or FREN 491</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Studies in European Francophone Literatures, Films and Cultures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or North American Francophone Cultures through Literature and Film</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Seminar in French and Francophone Studies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANG 480 Capstone: Global Connections</td>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Credits</td>
</tr>
</tbody>
</table>

This is only an example. It is highly recommended that any student interested in a French major see a faculty member for an individualized plan. This is particularly important if you are an education major and or start the major after the Freshman year. Students must complete all Essential Studies requirements and all departmental elective requirements to graduate.

### B.A. with Major in Language: German Studies

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GERM 101 First Year German I</td>
<td>4</td>
</tr>
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</table>

**Course related to German Studies**: 3

**Essential Studies/Electives**: 9

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Spring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERM 201 Second Year German I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Course related to German Studies**: 3

**Essential Studies/Electives**: 9

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>300-level German Studies elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Course related to German Studies**: 3

**Essential Studies/Electives**: 10

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
</tr>
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<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>300-level German Studies elective</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Credits</td>
</tr>
</tbody>
</table>
B.A. with Major in Language: Norwegian

Freshman Year
Fall
NORW 101 First Year Norwegian I 4
Essential Studies/Electives 12
Credits 16
Spring
NORW 102 First Year Norwegian II 4
Essential Studies/Electives 11
Credits 15
Sophomore Year
Fall
NORW 201 Second Year Norwegian I 4
Essential Studies/Electives 12
Credits 16
Spring
NORW 202 Second Year Norwegian II 4
Essential Studies/Electives 12
Credits 16
Junior Year
Fall
NORW 350 Norwegian Culture 3
NORW 432 Advanced Norwegian 3
Essential Studies/Electives 10
Credits 16
Spring
NORW 431 Advanced Norwegian 3
NORW 403 Great Literary Works of Norway 3
Essential Studies/Electives 9
Credits 15
Senior Year
Fall
NORW 433 Norwegian Literature 3
Essential Studies/Electives 12
Credits 15
Spring
NORW 434 Norwegian Literature 3
LANG 480 Capstone: Global Connections 3
Essential Studies/Electives 10
Credits 16
Total Credits 125

This is only an example. It is highly recommended that any student interested in a Norwegian major see a faculty member for an individualized plan. This is also true for those students who start the major after their Freshman year. Students must complete all Essential Studies requirements and departmental elective requirements to graduate.

B.A. with Major in Language: Spanish

Freshman Year
Fall
SPAN 101 First Year Spanish I 4
Essential Studies/Electives 12
Credits 16
Spring
SPAN 102 First Year Spanish II 4
Essential Studies/Electives 11
Credits 15
Sophomore Year
Fall
Essential Studies/Electives 12
SPAN 201 Second Year Spanish I 4
Credits 16
Spring
SPAN 202 Second Year Spanish II 4
Essential Studies/Electives 12
Credits 15
Junior Year
Fall
Essential Studies/Electives 6
SPAN 307 Literary Analysis 3
SPAN 308 Spanish Conversation 3
SPAN 311 Spanish American Civilization and Culture 3
Credits 15
Spring
Essential Studies/Electives 7
SPAN 304 Spanish Phonetics 3
SPAN 309 Spanish Composition 3
SPAN 310 Spanish Civilization and Culture 3
Credits 16
Senior Year
Fall
Essential Studies/Electives 10
SPAN 420 Early Spanish Literature Culture or Modern Contemporary Spanish Literature Culture 3
or SPAN 421 Early Latin American Literature Culture or Modern Contemporary Latin American Literature Culture 3
LANG 480 Capstone: Global Connections 3
Credits 16
Spring
SPAN 422 Early Latin American Literature Culture or Modern Contemporary Latin American Literature Culture 3
or SPAN 423 Seminar in Hispanic Literature, Culture and Linguistics or Advanced Spanish Grammar 3
Essential Studies/Electives 9
Credits 15
Total Credits 125

This is only an example. It is highly recommended that any student interested in a Spanish major see a faculty member for an individualized plan. This is also true for those who start the major after their Freshman year. Students must complete all Essential Studies requirements and all departmental elective requirements to graduate.

Mathematics

B.S. with Major in Mathematics
B.S. with Major in Mathematics with Secondary Education Certification
B.S. with Major in Mathematics

Freshman Year

Fall Credits
CSCI 160 Computer Science I 4
CSCI 160L Computer Prog I Lab 0
ENGL 110 College Composition I 3
MATH 165 Calculus I 4
general/essential studies elective 6-7
Credits 17-18

Spring
MATH 207 Introduction to Linear Algebra 2
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 166 Calculus II 4
PHYS 251 University Physics I 4
general/essential studies elective(s) 3-6
Credits 16-19

Sophomore Year

Fall
MATH 208 Discrete Mathematics 3
MATH 265 Calculus III 4
general/essential studies elective(s) 6-9
Credits 13-16

Spring
MATH 266 Elementary Differential Equations 3
MATH 330 Set Theory and Logic 3
general/essential studies elective(s) 6-9
Credits 12-15

Junior Year

Fall
MATH 321 Applied Statistical Methods 3
MATH 441 Abstract Algebra 3
general/essential studies elective(s) 6-9
Credits 12-15

Spring
MATH 435 Theory of Numbers 3
general/essential studies elective(s) 9-12
Credits 12-15

Senior Year

Fall
MATH 488 Senior Capstone 3
MATH 425 Cryptological Mathematics 3
general/essential studies elective(s) 6-9
Credits 12-15

Spring
MATH 408 Combinatorics 3
general/essential studies elective(s) 9-12
Credits 12-15

Total Credits 106-128

This is only a representative plan. This plan assumes that the student will use Math408-Math425 to satisfy the departmental depth requirement. Also this plan assumes an even-numbered Freshman year since Math425 is offered in odd fall years. Please consult your academic adviser to develop your individual 4-year plan. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.S. with Major in Mathematics with Secondary Education Certification

Freshman Year

Fall Credits
CSCI 160 Computer Science I 4
CSCI 160L Computer Prog I Lab 0
ENGL 110 College Composition I 3
MATH 165 Calculus I 4
general/essential studies elective 6-7
Credits 17-18

Spring
MATH 207 Introduction to Linear Algebra 2
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 166 Calculus II 4
MATH 207 Introduction to Linear Algebra 2
PHYS 251 University Physics I 4
general/essential studies elective 3-4
Credits 16

Sophomore Year

Fall
MATH 208 Discrete Mathematics 3
MATH 265 Calculus III 4
T&L 250 Introduction to Education 3
general/essential studies elective(s) 6
Credits 16

Spring
MATH 266 Elementary Differential Equations 3
MATH 330 Set Theory and Logic 3
T&L 339 Technology for Teachers 2
T&L 432 Learning Environments 3
general/essential studies elective(s) 6
Credits 17

Junior Year

Fall
MATH 321 Applied Statistical Methods 3
MATH 409 Geometry 3
T&L 319 Inclusive Strategies 3
T&L 350 Development and Education of the Adolescent 3
general/essential studies elective(s) 6
Credits 18

Spring
MATH 308 History of Mathematics 3
MATH 435 Theory of Numbers 3
T&L 345 Curriculum Development and Instruction 3
T&L 433 Multicultural Education 3
MATH 399 Methods for Secondary Teachers: Mathematical Content Knowledge 3
general/essential studies elective(s) 3-6
Credits 18-21

Senior Year

Fall
MATH 400 Methods for Teaching Middle and Secondary Mathematics: Pedagogical Content Knowledge 3
MATH 441 Abstract Algebra 3
MATH 488 Senior Capstone 3
T&L 486 Field Experience 1-4
general/essential studies elective(s) 6
Credits 16-19

Spring
T&L 487 Student Teaching 4-16
This is only a representative plan, however there are only a limited number of options. Consult your academic adviser regularly. 125 credits are needed to graduate. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Music

B.A. with Major in Music - Concentration Option

B.A. with Major in Music - Concentration Option - Composition Emphasis (Even Fall Entry)

B.A. with Major in Music - Concentration Option - Composition Emphasis (Odd Fall Entry)

B.A. with Major in Music - Foreign Language Option

B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Even Fall Entry)

B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Odd Fall Entry)

B.A. with Major in Music - Concentration Option

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Major Ensemble Consult Advisor</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 154 Individual Lessons 1</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 131 Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td>Essential Studies Math/Science/Technology (Q)</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 133 Keyboard Skills I KS or MUSC 154</td>
<td>1</td>
</tr>
<tr>
<td>or Individual Lessons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
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</table>

Spring

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUSC 136 Keyboard Skills II or MUSC 154</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>MUSC 135 Aural Skills II</td>
</tr>
<tr>
<td>MUSC 154 Individual Lessons</td>
</tr>
<tr>
<td>Electives</td>
</tr>
<tr>
<td>Essential Studies Math/Science/Technology</td>
</tr>
<tr>
<td>MUSC 134 Music Theory II</td>
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<tr>
<td>Major Ensemble</td>
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Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music Electives</td>
<td>2</td>
</tr>
<tr>
<td>Essential Studies Social Science (U)</td>
<td>3</td>
</tr>
<tr>
<td>Concentration</td>
<td>6</td>
</tr>
<tr>
<td>MUSC 310 Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>16</td>
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</table>

Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
</tr>
<tr>
<td>Concentration</td>
</tr>
<tr>
<td>Music Electives</td>
</tr>
<tr>
<td>MUSC 311 Music History Survey II</td>
</tr>
<tr>
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Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td>Essential Studies Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Music Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
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</table>

Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
</tr>
<tr>
<td>Electives</td>
</tr>
<tr>
<td>MUSC 203 Music and Culture</td>
</tr>
<tr>
<td>MUSC 490 Seminar in Music</td>
</tr>
<tr>
<td>MUSC 492 Senior Project</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Total Credits 125

KS = Keyboard Skills or Piano Lessons.
1 = on Primary Instrument.

^^ Please note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.A. with Major in Music - Concentration Option - Composition Emphasis (Even Fall Entry)

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 154 Individual Lessons 1</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 133 Keyboard Skills I KS or MUSC 154</td>
<td>1</td>
</tr>
<tr>
<td>or Individual Lessons Consult Advisor</td>
<td></td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>Essential Studies Humanities (Non-Music)</td>
<td>3</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 254 Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

B.A. with Major in Music - Concentration Option - Composition Emphasis (Odd Fall Entry)

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 154 Individual Lessons 1</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 130 Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 133 Keyboard Skills I KS or MUSC 154</td>
<td>1</td>
</tr>
<tr>
<td>or Individual Lessons Consult Advisor</td>
<td></td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>Essential Studies Humanities (Non-Music)</td>
<td>3</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 131 Aural Skills I</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
### Freshman Year

**Fall**
- **ENGL 110** College Composition I 3
- **Major Ensemble** Consult Advisor 1
- **MUSC 130** Music Theory I 3
- **MUSC 154** Individual Lessons 1 1
- **Electives** 2
- **Essential Studies Math/Science/Technology (Q)** 3
- **MUSC 131** Aural Skills I 3
- **Credits** 15

**Spring**
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **MUSC 133** Keyboard Skills I KS 1
- **MUSC 154** Individual Lessons 1
- **Electives** 2
- **Essential Studies Math/Science/Technology (Q)** 3
- **MUSC 131** Aural Skills I 1
- **Credits** 15

### Sophomore Year

**Fall**
- **Electives** 3
- **Essential Studies Humanities (Non-Music)** 3
- **Major Ensemble** 1
- **MUSC 231** Aural Skills III 1
- **MUSC 230** Music Theory III 3
- **COMM 110** Fundamentals of Public Speaking 3
- **Credits** 15

**Spring**
- **MUSC 235** Aural Skills IV 1
- **Essential Studies Social Science** 3
- **Major Ensemble** 1
- **Electives** 4
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 254** Individual Lessons 1
- **Credits** 15

### Junior Year

**Fall**
- **Concentration 4**
- **MUSC 310** Music History Survey I 3
- **MUSC 429** Composition 2
- **Music Electives** 2
- **Essential Studies Social Science** 3
- **Credits** 15

**Spring**
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **MUSC 134** Music Theory II 3
- **MUSC 136** or MUSC 154 Keyboard Skills II or Individual Lessons 1
- **Electives** 2
- **Essential Studies Math/Science/Technology (Q)** 3
- **Major Ensemble** 1
- **Credits** 16

### Senior Year

**Fall**
- **Concentration 6**
- **MUSC 423** Instrumental and Choral Arranging 2
- **MUSC 430** Composition Lessons 1
- **Music Electives** 3
- **Essential Studies Social Science** 3
- **Credits** 15

**Spring**
- **Electives** 3
- **Essential Studies Social Science** 3
- **Major Ensemble** 1
- **MUSC 231** Aural Skills III 1
- **MUSC 254** Individual Lessons 1
- **MUSC 230** Music Theory III 3
- **COMM 110** Fundamentals of Public Speaking 3
- **Credits** 15

### Junior Year

**Fall**
- **Concentration 4**
- **MUSC 429** Composition 2
- **Music Electives** 2
- **MUSC 310** Music History Survey I 3
- **Credits** 15

### B.A. with Major in Music - Concentration Option - Composition Emphasis (Odd Fall Entry)

**Freshman Year**

**Fall**
- **ENGL 110** College Composition I 3
- **Major Ensemble** Consult Advisor 1
- **MUSC 130** Music Theory I 3
- **MUSC 154** Individual Lessons 1
- **Electives** 1
- **Essential Studies Math/Science/Technology (Q)** 3
- **MUSC 131** Aural Skills I 1
- **Credits** 15

**Spring**
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **MUSC 133** Keyboard Skills I KS 1
- **MUSC 154** Individual Lessons 1
- **Electives** 2
- **Essential Studies Math/Science/Technology (Q)** 3
- **Major Ensemble** 1
- **Credits** 16

**Sophomore Year**

**Fall**
- **Electives** 3
- **Essential Studies Humanities (Non-Music)** 3
- **Major Ensemble** 1
- **MUSC 231** Aural Skills III 1
- **MUSC 254** Individual Lessons 1
- **MUSC 230** Music Theory III 3
- **COMM 110** Fundamentals of Public Speaking 3
- **Credits** 15

**Spring**
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 235** Aural Skills IV 1
- **MUSC 254** Individual Lessons 1
- **Essential Studies Lab Science** 4
- **Major Ensemble** 1
- **Credits** 16

**Junior Year**

**Fall**
- **Concentration 6**
- **MUSC 423** Instrumental and Choral Arranging 2
- **MUSC 430** Composition Lessons 1
- **Music Electives** 3
- **Essential Studies Social Science** 3
- **Credits** 15

**Spring**
- **MUSC 423** Music and Culture 3
- **MUSC 490** Seminar in Music 3
- **MUSC 492** Senior Project 2
- **MUSC 340** Introduction to Music Technology 2
- **Credits** 15

**Total Credits** 125

1 = On Primary Instrument.
KS = Keyboard Skills or Piano Lessons.
^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
# Bachelor of Arts with Major in Music - Foreign Language Option

### Freshman Year

**Fall**
- **ENGL 110** College Composition I 3
- **Major Ensemble** C Music Theory I 1
- **MUSC 130** Music Theory I 3
- **MUSC 154** Individual Lessons 1
- **MUSC 133 or MUSC 154** Keyboard Skills I 1
- Electives 3
- **MUSC 131** Aural Skills I 1

**Credits** 16

**Spring**
- **Electives** 3

**Credits** 16

### Sophomore Year

**Fall**
- **MUSC 231** Aural Skills II 1
- **COMM 110** Fundamentals of Public Speaking 3
- **Major Ensemble** 1
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 254** Individual Lessons 1
- **MUSC 310** Music History Survey I 3
- Electives 3

**Credits** 15

**Spring**
- **Electives** 3

**Credits** 16

### Junior Year

**Fall**
- **Foreign Language I** 4
- **MUSC 203** Music and Culture 3
- **MUSC 490** Seminar in Music 3
- **MUSC 492** Senior Project 2
- **MUSC 311** Music History Survey II 3
- Electives 6

**Credits** 15

**Spring**
- **Foreign Language II** 4
- **MUSC Electives** 2
- **Electives** 6

**Credits** 16

### Senior Year

**Fall**
- **Electives** 6
- **Foreign Language III** 4
- **MUSC Electives** 3

**Credits** 16

**Spring**
- **Electives** 3
- **MUSC 203** Music and Culture 3
- **MUSC 490** Seminar in Music 3
- **MUSC 492** Senior Project 2

**Credits** 15

**Total Credits** 125

---

1 = On Primary Instrument.

KS = Keyboard Skills or Piano Lessons. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

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### B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Even Fall Entry)

**Freshman Year**

**Fall**
- **ENGL 110** College Composition I 3
- **Major Ensemble** C 1
- **MUSC 130** Music Theory I 3
- **MUSC 154** Individual Lessons 1
- **MUSC 133 or MUSC 154** Keyboard Skills I 1
- Electives 3
- **MUSC 131** Aural Skills I 1

**Credits** 16

**Spring**
- **MUSC 136 or MUSC 154** Keyboard Skills II 1
- **MUSC 135** Aural Skills II 1
- **MUSC 154** Individual Lessons 1
- **MUSC 134** Music Theory II 3
- **Major Ensemble** C 1
- **Electives** 3
- **ENGL 130** Composition II: Writing for Public Audiences 3

**Credits** 16

---

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### B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Even Fall Entry)

**Freshman Year**

**Fall**
- **ENGL 110** College Composition I 3
- **Major Ensemble** C 1
- **MUSC 130** Music Theory I 3
- **MUSC 154** Individual Lessons 1
- **MUSC 133 or MUSC 154** Keyboard Skills I 1
- Electives 3
- **MUSC 131** Aural Skills I 1

**Credits** 16

---

1 = On Primary Instrument.

KS = Keyboard Skills or Piano Lessons. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
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B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Odd Fall Entry)

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Total Credits: 125

MUSC 423 Instrumental and Choral Arranging 2
MUSC 430 Composition Lessons 1

Credits

Spring

Foreign Language IV 4
MUSC 203 Music and Culture 3
MUSC 490 Seminar in Music 3
MUSC 492 Senior Project 2
MUSC 340 Introduction to Music Technology 2
MUSC 430 Composition Lessons 1

Credits

Total Credits: 125

B.A. with Major in Music - Foreign Language Option - Composition Emphasis (Odd Fall Entry)
### University of North Dakota

#### MUSC 254 Individual Lessons

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### Total Credits

- **125 Credits**

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### Music Education

#### B.M. with Major in Music Education - Choral Track (Even Fall Entry)

#### B.M. with Major in Music Education - Choral Track (Odd Fall Entry)

#### B.M. with Major in Music Education - Instrumental Track (Even Fall Entry)

#### B.M. with Major in Music Education - Instrumental Track (Odd Fall Entry)

#### B.M. with Major in Music Education - Choral Track (Even Fall Entry)

### Freshman Year

<table>
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<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Description</th>
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<td>Individual Lessons</td>
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<td>MUSC 180</td>
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<td>Fundamentals of Public Speaking</td>
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<td>MUSC 140</td>
<td>Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<td>MUSC 427</td>
<td>Analysis of Musical Form</td>
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<td>MUSC 444</td>
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<td>Instrumental Literature</td>
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<td>MUSC 357</td>
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1 = On Primary Instrument.

KS = Keyboard Skills or Piano Lessons. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
B.M. with Major in Music Education - Choral Track (Odd Fall Entry)

**Freshman Year**

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<th>Fall</th>
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<tbody>
<tr>
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<td>Aural Skills I</td>
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<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
</tr>
<tr>
<td>or MUSC 154</td>
<td>Individual Lessons</td>
</tr>
<tr>
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<td>College Composition I</td>
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**Spring**

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<td>MUSC 135</td>
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<tr>
<td>MUSC 136</td>
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<tr>
<td>or MUSC 154</td>
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<tr>
<td>MUSC 154</td>
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<tr>
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**Sophomore Year**

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<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
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<td>MUSC 446</td>
<td>Instrumental Classroom Methods and Materials</td>
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<tr>
<td>Essential Studies Math/Science/Technology (Q)</td>
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<tr>
<td>MUSC 152</td>
<td>Class Guitar for Music Majors</td>
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**Spring**

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<td>MUSC 135</td>
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<td>MUSC 136</td>
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<td>or MUSC 154</td>
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**Senior Year**

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<td>MUSC 140</td>
<td>Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<tr>
<td>MUSC 230</td>
<td>Music Theory III</td>
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<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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<tr>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
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<td>or MUSC 254</td>
<td>Individual Lessons</td>
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<tr>
<td>MUSC 254</td>
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**Spring**

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**B.M. with Major in Music Education - Instrumental Track (Even Fall Entry)**

### Freshman Year

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<tbody>
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<td>MUSC 131 Aural Skills I</td>
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<td>ENGL 110 College Composition I</td>
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<td>MUSC 133 Keyboard Skills I or MUSC 154 Individual Lessons</td>
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<tr>
<td>MUSC 154 Individual Lessons</td>
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### Sophomore Year

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<td>MUSC 230 Music Theory III</td>
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<td>MUSC 231 Aural Skills III</td>
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<td>MUSC 256 Basic Conducting</td>
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<td>MUSC 234 Music Theory IV: Music Theory since 1900</td>
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### Junior Year

<table>
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<td>MUSC 310 Music History Survey I</td>
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<td>MUSC 417 Instrumental Literature</td>
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<td>MUSC 427 Analysis of Musical Form</td>
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### Senior Year

<table>
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<td>MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<tr>
<td>MUSC 423 Instrumental and Choral Arranging</td>
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<tr>
<td>MUSC 440 Methods and Materials for Elementary Music</td>
<td>3</td>
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<td>MUSC 446 Instrumental Classroom Methods and Materials</td>
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<td>Essential Studies Math/Science/Technology</td>
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<td>MUSC 459 Senior Recital</td>
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### Credits

- **Total Credits**: 132-133

**B.M. with Major in Music Education - Instrumental Track (Odd Fall Entry)**

### Freshman Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
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<tbody>
<tr>
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<tr>
<td>MUSC 133 Keyboard Skills I or MUSC 154 Individual Lessons</td>
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### Junior Year

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<td>MUSC 445 Choral Methods For Directors</td>
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<td>Essential Studies Humanities (Non-Music)</td>
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<td>MUSC 354 Individual Lessons</td>
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<td>MUSC 417 Instrumental Literature</td>
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<td>MUSC 427 Analysis of Musical Form</td>
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<td>T&amp;L 433 Multicultural Education</td>
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### Senior Year

<table>
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<tbody>
<tr>
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<tr>
<td>MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<td>MUSC 423 Instrumental and Choral Arranging</td>
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<td>T&amp;L 386 Field Experience</td>
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### Credits

- **Total Credits**: 132-133

**Notes**:

- KS = Keyboard Skills or Piano Lessons if primary instrument is piano.
- 1 = On primary instrument.
- 2 = Course Required only for Optional Choral Licensure.
- **Please Note**: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
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<td>Major Ensemble</td>
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<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<td>MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<td>MUSC 154 Individual Lessons</td>
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| **Spring** | MUSC 340 Introduction to Music Technology | 2 |
| | Essential Studies Math/Science/Technology (Q) | 3 |
| | T&L 486 Field Experience | 1 |

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| **Spring** | T&L 487 Student Teaching | 16 |
| | T&L 488 Senior Seminar | 1 |
| **Total Credits** | 17 |

| **Total Credits** | 132-133 |

KS = Keyboard Skills or Piano Lessons.
1 = On Primary Instrument.
2 = Course only Required for Optional Choral Licensure.

Welcome to the B.M. with Major in Music Therapy! This program is designed for students passionate about music and its role in society. From composition and performance to music education, our curriculum will equip you with the skills necessary to excel in the field of Music Therapy.

**B.M. with Major in Music Therapy (Even Fall Entry)**

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| **Spring** | MUSC 136 or MUSC 154 Keyboard Skills II or Individual Lessons | 1 |
| | Major Ensemble | 1 |
| | MUSC 154 Individual Lessons | 1 |
| | MUSC 252 Class Guitar for Music Majors | 1 |

**B.M. with Major in Music Therapy (Odd Fall Entry)**

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| **Spring** | MUSC 136 or MUSC 154 Keyboard Skills II or Individual Lessons | 1 |
| | Major Ensemble | 1 |
| | MUSC 154 Individual Lessons | 1 |
| | MUSC 252 Class Guitar for Music Majors | 1 |

For more information, please visit our Academic Website at http://und.edu/academics/essential-studies/requirements.cfm

Music Therapy
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1 = On Primary Instrument.
2 = Waived if Voice is primary instrument.
3 = See Advisor for Electives approved by American Music Therapy Association (AMTA). ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

B.M. with Major in Music Therapy (Odd Fall Entry)

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Spring

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<td>or MUSC 154</td>
<td>or Individual Lessons</td>
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</tr>
<tr>
<td>MUSC 151</td>
<td>Class Lessons (Voice)</td>
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<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
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<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
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Sophomore Year

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<tr>
<td>MUSC 280</td>
<td>Music Therapy Clinical Skills</td>
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<tr>
<td>T&amp;L 315</td>
<td>Education of Exceptional Students</td>
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<tr>
<td>MUSC 256</td>
<td>Basic Conducting</td>
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<td>MUSC 233</td>
<td>Keyboard Skills III</td>
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<tr>
<td>MUSC 282</td>
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**Spring**

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<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
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<td>MUSC 235</td>
<td>Aural Skills IV</td>
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<td>MUSC 254</td>
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<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
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<td>or MUSC 254</td>
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<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
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<td>MUSC 281</td>
<td>Music Therapy Techniques I</td>
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<tr>
<td>MUSC 382</td>
<td>Music Therapy Practicum II</td>
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| Credits | 16 |

**Junior Year**

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<tr>
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<tbody>
<tr>
<td>MUSC 383</td>
<td>Music Therapy Practicum III</td>
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<tr>
<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
<td>2</td>
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<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
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<tr>
<td>MUSC 354</td>
<td>Individual Lessons</td>
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<td>PSYC 250</td>
<td>Developmental Psychology</td>
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<tr>
<td>MUSC 381</td>
<td>Music Therapy Techniques II</td>
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| Credits | 16 |

<table>
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<tr>
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<tr>
<td>MUSC 354</td>
<td>Individual Lessons</td>
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<tr>
<td>MUSC 311</td>
<td>Music History Survey II</td>
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<tr>
<td>MUSC 380</td>
<td>Music Therapy Theories and Methods II (Adults)</td>
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<tr>
<td>MUSC 481</td>
<td>Music Therapy Practicum IV</td>
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<tr>
<td>MUSC 399</td>
<td>Special Topics (Music Therapy Improvisation)</td>
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| Credits | 17 |

**Senior Year**

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<thead>
<tr>
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<tbody>
<tr>
<td>MUSC 397</td>
<td>Cooperative Education in Music</td>
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<td>AMTA Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>COMM 110</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ANAT 204</td>
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<td></td>
<td>ANAT 204L</td>
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<td></td>
<td>SOC 326</td>
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<td>MUSC 454</td>
<td>1</td>
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<tr>
<td></td>
<td>Essential Studies Humanities (Non-Music)</td>
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| Credits | 17 |

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MUSC 454</td>
<td>Individual Lessons</td>
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<tr>
<td>MUSC 490</td>
<td>Seminar in Music</td>
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<tr>
<td>MUSC 480</td>
<td>Psychological Foundations of Music Learning</td>
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<tr>
<td>MUSC 340</td>
<td>Introduction to Music Technology</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
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</table>

| Credits | 15 |

**Professional Year 1**

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>MUSC 397</td>
<td>Cooperative Education in Music</td>
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</tr>
<tr>
<td>or MUSC 497</td>
<td>or Music Therapy Internship</td>
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| Credits | 2 |

| Total Credits | 130 |

1 = On Primary Instrument.
KS = Keyboard Skills or Piano Lessons.
2 = Waived for Students with Voice as Primary Instrument.
3 = Consult Advisor for Courses that Will Fit with American Music Therapy Association (AMTA) Requirements. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

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**Musical Theatre**

**B.F.A. in Musical Theatre with a Major in Theatre Arts**

**First Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
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<td><strong>First Semester</strong></td>
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<tr>
<td>MUSC 130</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 131</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 155</td>
<td>2</td>
</tr>
<tr>
<td>THEA 161</td>
<td>3</td>
</tr>
<tr>
<td>THEA 270</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>1</td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
<th>Semester</th>
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<tbody>
<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>THEA Elective</td>
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<tr>
<td>MUSC 255</td>
<td>2</td>
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<tr>
<td>MUSC 257</td>
<td>2</td>
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<tr>
<td>THEA Elective</td>
<td>3</td>
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<tr>
<td>THEA Elective</td>
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| Credits | 17 |

**Second Year**

<table>
<thead>
<tr>
<th>Semester</th>
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<tbody>
<tr>
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<tr>
<td>THEA 230</td>
<td>3</td>
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<td>THEA 271</td>
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<td>MUSC 255</td>
<td>2</td>
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<td>THEA 204</td>
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<td>THEA 241</td>
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<td>THEA 242</td>
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<td>COMM 110</td>
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| Credits | 17 |

<table>
<thead>
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<th>Semester</th>
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<tbody>
<tr>
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<td>THEA Elective</td>
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<tr>
<td>MUSC 255</td>
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| Credits | 17 |

**Third Year**

<table>
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<tr>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>MUSC 260, 263 or 264 Choral Ensemble</td>
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<tr>
<td>Science (with Lab)</td>
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<tr>
<td>Humanities (G)</td>
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<tr>
<td>THEA 300</td>
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| Credits | 15 |

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**AMTA Electives**

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<th>Course Title</th>
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<tbody>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
<td>3</td>
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<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
<td>1</td>
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<tr>
<td>MUSC 155</td>
<td>Individual Lessons</td>
<td>2</td>
</tr>
<tr>
<td>THEA 161</td>
<td>Acting I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 270</td>
<td>Stagecraft</td>
<td>3</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
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<td><strong>Credits</strong></td>
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**Additional Information**

- **Credits**: Total 130
- **1** = On Primary Instrument.
- **KS** = Keyboard Skills or Piano Lessons.
- **2** = Waived for Students with Voice as Primary Instrument.
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THEA 120 Voice and Movement I 2
MUSC 355 Individual Lessons 4
THEA 240 Ballet I 2

Second Semester
THEA Elective 3
Social Science 3
THEA 220 Voice and Movement II 2
THEA 344 Musical Theatre Dance Style 2
THEA 371 Advanced Acting: Advanced Scene Study 3
MUSC 355 Individual Lessons 4

Credits 19

Fourth Year

First Semester
THEA Elective 3
THEA Elective 3
THEA 450 Musical Theatre History 3
THEA 423 History of the Theatre: Classical, Medieval and Renaissance 3
MUSC 455 Individual Lessons (THEA Elective) 4

Credits 20

Second Semester
THEA Elective 3
THEA Elective 3
THEA 424 History of the Theatre: Seventeenth Century to the Present 3
THEA 404 Acting for the Music Theatre 3
THEA 494 Senior Project 4
MUSC 455 Individual Lessons 4

Credits 19

Total Credits 141

^Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Philosophy and Religion

B.A. with Major in Philosophy and Religion: Philosophy Concentration

B.A. with Major in Philosophy and Religion: Pre-Law Concentration

B.A. with Major in Philosophy and Religion: Religion Concentration

B.A. with Major in Philosophy and Religion: Philosophy Concentration

Freshman Year

First Semester
PHIL 101 Introduction to Philosophy 3
ENGL 110 College Composition I 3
Electives/Essential Studies 10

Credits 16

Second Semester
ENGL 130 3
Electives/Essential Studies 9
PHIL 110 Introduction to Logic 3

Credits 15

Sophomore Year

First Semester
Electives/Essential Studies 12

Second Semester
PHIL 120 Introduction to Ethics 3
PHIL 130 or Introduction to Political Philosophy 3
PHIL 221 or Symbolic Logic 3
PHIL 250 or Ethics in Engineering and Science 3
PHIL 251 or Ethics in Health Care 3
PHIL 252 or Ethics in Business and Public Administration 3
PHIL 253 or Environmental Ethics 3

Credits 18

Junior Year

First Semester
PHIL Elective 3
Electives/Essential Studies 9

Credits 12

Second Semester
PHIL 312 American Philosophy 3
PHIL 321 or Analytic Philosophy 3
PHIL 331 or Continental Philosophy 3
PHIL 342 or Ethical Theory 3
PHIL 355 or Social and Political Philosophy 3
PHIL 360 or Feminist Philosophy 3
PHIL 383 or Asian Philosophy 3

Credits 15

Senior Year

First Semester
PHIL Elective 3
Electives/Essential Studies 9

Credits 12

Second Semester
PHIL 480 Public Philosophy 3

Credits 15

Total Credits 127

^The Capstone is not offered every semester. Students need to pay attention to when the capstone is offered and may need to take it as early as the second semester of the junior year.
This plan represents only one way of completing a major in Philosophy and Religion (Philosophy concentration). Students should work closely with faculty advisors to determine how best to meet their individual interests and goals. Students who identify Philosophy and Religion as a major later in their undergraduate careers can complete this concentration. Students who major in Philosophy and Religion are encouraged to explore a wide range of academic topics and fields of study as they select their electives. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### B.A. with Major in Philosophy and Religion: Pre-Law Concentration

#### Freshman Year

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<th>Fall</th>
<th>Credits</th>
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<tr>
<td>PHIL 101</td>
<td>3</td>
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<tr>
<td>Electives/Essential Studies</td>
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#### Spring

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<tbody>
<tr>
<td>ENGL 130</td>
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<tr>
<td>PHIL 110</td>
</tr>
<tr>
<td>PHIL 130 or PHIL 312 or PHIL 355 or PHIL 360 or PHIL 450 or PHIL 451</td>
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<tr>
<td>or PHIL 360 or Feminist Philosophy</td>
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<tr>
<td>or PHIL 450 or Philosophy, Economics, and Politics</td>
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<td>or PHIL 451 or Citizenship and Political Participation</td>
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#### Sophomore Year

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#### Junior Year

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<td>PHIL 251 or PHIL 252 or PHIL 253 or PHIL 342 or PHIL 425</td>
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<tr>
<td>or Ethics in Health Care</td>
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<td>or Ethics in Business and Public Administration</td>
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<td>or Environmental Ethics</td>
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<td>or Metaethics - Is Ethics Possible?</td>
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#### Senior Year

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<tbody>
<tr>
<td>PHIL or RELS Elective</td>
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<td>Elective/Essential Studies</td>
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</table>

This plan represents only one way of completing a major in Philosophy and Religion (Pre-Law concentration). Students should work closely with faculty advisors to determine how best to meet their individual interests and goals. Students who identify Philosophy and Religion as a major later in their undergraduate careers can complete this concentration. Students who major in Philosophy and Religion are encouraged to explore a wide range of academic topics and fields of study as they select their electives. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### B.A. with Major in Philosophy and Religion: Religion Concentration

#### Freshman Year

<table>
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<tr>
<th>Fall</th>
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</thead>
<tbody>
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<tr>
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<td>Electives/Essential Studies</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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#### Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective/Essential Studies</td>
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</tr>
<tr>
<td>or Religions of the West</td>
</tr>
<tr>
<td>or Development of Christian Doctrine</td>
</tr>
<tr>
<td>or Judaism</td>
</tr>
<tr>
<td>or Contemporary Christianities</td>
</tr>
<tr>
<td>or Islam</td>
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#### Sophomore Year

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>RELS Elective</td>
</tr>
<tr>
<td>Elective/Essential Studies</td>
</tr>
<tr>
<td>RELS 102 or RELS 315 or RELS 320 or RELS 380 or RELS 410</td>
</tr>
<tr>
<td>or Religions of Asia</td>
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<tr>
<td>or Daoism and Confucianism</td>
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<tr>
<td>or Hinduism</td>
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<tr>
<td>or Buddhism</td>
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<td>or Asian Religions in the United States</td>
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#### Junior Year

<table>
<thead>
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<th>Credits</th>
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<tbody>
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<td>Elective/Essential Studies</td>
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<tr>
<td>or Jewish Scripture/Old Testament</td>
</tr>
<tr>
<td>or Christian Scripture/New Testament</td>
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<tr>
<td>or Jesus in Gospel and History</td>
</tr>
<tr>
<td>or Life and Religion of Paul</td>
</tr>
<tr>
<td>or Prophets and Prophecy</td>
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</tbody>
</table>

This plan represents only one way of completing a major in Philosophy and Religion (Religion concentration). Students should work closely with faculty advisors to determine how best to meet their individual interests and goals. Students who identify Philosophy and Religion as a major later in their undergraduate careers can complete this concentration. Students who major in Philosophy and Religion are encouraged to explore a wide range of academic topics and fields of study as they select their electives. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
### University of North Dakota

#### RELS Electives

<table>
<thead>
<tr>
<th>Course(s)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>RELS 120 Religion in America</td>
<td>3</td>
</tr>
<tr>
<td>or RELS 216 or Women and Religion</td>
<td></td>
</tr>
<tr>
<td>or RELS 245 or Death and Dying</td>
<td></td>
</tr>
<tr>
<td>or RELS 250 or East and West in Religion</td>
<td></td>
</tr>
<tr>
<td>or RELS 305 or Mysticism</td>
<td></td>
</tr>
<tr>
<td>or RELS 309 or Atheism, Theism and Secularism</td>
<td></td>
</tr>
<tr>
<td>or RELS 342 or Religious Ethics</td>
<td></td>
</tr>
<tr>
<td>or RELS 423 or Psychology of Religion</td>
<td></td>
</tr>
<tr>
<td>or RELS 431 or Religious Violence and the Apocalyptic Mind</td>
<td></td>
</tr>
<tr>
<td>or RELS 466 or Sex, Gender and Religion</td>
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</table>

#### Spring

<table>
<thead>
<tr>
<th>Elective/Essential Studies 12 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELS 120 Religion in America</td>
</tr>
<tr>
<td>or RELS 216 or Women and Religion</td>
</tr>
<tr>
<td>or RELS 245 or Death and Dying</td>
</tr>
<tr>
<td>or RELS 250 or East and West in Religion</td>
</tr>
<tr>
<td>or RELS 305 or Mysticism</td>
</tr>
<tr>
<td>or RELS 309 or Atheism, Theism and Secularism</td>
</tr>
<tr>
<td>or RELS 342 or Religious Ethics</td>
</tr>
<tr>
<td>or RELS 423 or Psychology of Religion</td>
</tr>
<tr>
<td>or RELS 431 or Religious Violence and the Apocalyptic Mind</td>
</tr>
<tr>
<td>or RELS 466 or Sex, Gender and Religion</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
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</thead>
<tbody>
<tr>
<td>Credits 15</td>
</tr>
<tr>
<td>Elective/Essential Studies 12 Credits</td>
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<td>RELS Elective</td>
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#### Spring

<table>
<thead>
<tr>
<th>Elective/Essential Studies 8 Credits</th>
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<tbody>
<tr>
<td>RELS 480 Religion Capstone</td>
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#### Credits 15

This plan represents only one way of completing a major in Philosophy and Religion (Religion concentration). Students should work closely with faculty advisors to determine how best to meet their individual interests and goals. Students who identify Philosophy and Religion as a major later in their undergraduate careers can complete this concentration. Students who major in Philosophy and Religion are encouraged to explore a wide range of academic topics and fields of study as they select their electives. Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

### Physics

**B.S. with Major in Physics - four years, even year freshman enrollment (p. 295)**

**B.S. with Major in Physics - four years, odd year freshman enrollment (p. 296)**

**B.S. with Major in Physics - four years, even year freshman enrollment**

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 101 Survey of Physics &amp; Astrophysics</td>
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</tr>
<tr>
<td>PHYS 110 Introductory Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
<td>1</td>
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<tr>
<td>Essential Studies</td>
<td>3</td>
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<tr>
<td>MATH 165 Calculus I</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CHEM 121 General Chemistry I</td>
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#### Credits 15

### Physics

**B.S. with Major in Physics - four years, even year freshman enrollment**

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>PHYS 327 Electricity and Magnetism I</td>
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<td>Physics Elective</td>
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<tr>
<td>Essential Studies</td>
<td>3</td>
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<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 317 Mechanics I</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>PHYS 328 Electricity and Magnetism II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 325L Optics Laboratory</td>
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<tr>
<td>MATH 352 Introduction to Partial Differential Equations</td>
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<td>Physics Elective</td>
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<tr>
<td>PHYS 325 Optics</td>
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</tr>
<tr>
<td>PHYS 318 Mechanics II</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 415 Undergrad Research Experience</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 428 Advanced Physics Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Elective 1</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 431 Quantum Mechanics I</td>
<td>3</td>
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<tr>
<td>Physics Elective</td>
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<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 432 Quantum Mechanics II</td>
<td>3</td>
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<tr>
<td>Physics Elective</td>
<td>3</td>
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<tr>
<td>Physics Elective</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
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<tr>
<td>PHYS 324 Thermal Physics</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Senior Year Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Elective 1</td>
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</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 432 Quantum Mechanics II</td>
<td>3</td>
</tr>
</tbody>
</table>

### Credits 17

1 = Select an elective for a general physical degree or for one of four special tracks. **Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)**
Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.S. with Major in Physics - four years, odd year freshman enrollment

Freshman Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 101 Survey of Physics &amp; Astrophysics</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 110 Introductory Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121 General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
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</tr>
<tr>
<td>Credits</td>
<td>15</td>
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</table>

Spring

| CHEM 122L General Chemistry II Laboratory | 1 |
| MATH 166 Calculus II | 4 |
| Essential Studies | 3 |
| CHEM 122 General Chemistry II | 3 |
| PHYS 251 University Physics I | 4 |
| Credits | 15 |

Sophomore Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 252 University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
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</table>

Spring

| MATH 266 Elementary Differential Equations | 3 |
| PHYS 253 University Physics III | 4 |
| Essential Studies | 3 |
| Essential Studies | 3 |
| Elective | 1 |
| Credits | 16 |

Junior Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
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</thead>
<tbody>
<tr>
<td>PHYS 428 Advanced Physics Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 317 Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 327 Electricity and Magnetism I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Physics Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>1</td>
</tr>
<tr>
<td>Credits</td>
<td>17</td>
</tr>
</tbody>
</table>

Spring

| PHYS 328 Electricity and Magnetism II | 3 |
| PHYS 318 Mechanics II | 3 |
| PHYS 324 Thermal Physics | 3 |
| Essential Studies | 3 |
| MATH 352 Introduction to Partial Differential Equations | 3 |
| Credits | 15 |

Senior Year

<table>
<thead>
<tr>
<th>Fall Credits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 431 Quantum Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 415 Undergrad Research Experience</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Physics Elective</td>
<td>3</td>
</tr>
<tr>
<td>Physics Elective</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
</tbody>
</table>

1 = Select an elective for a general physical degree or for one of four special tracks. **Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm**

Psychology

B.A. or B.S. with Major in Psychology

Freshman Year

<table>
<thead>
<tr>
<th>First Semester Credits</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I (ES course)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103 College Algebra (ES course &amp; Major requirement)</td>
<td>3</td>
</tr>
<tr>
<td>FREN 101 First Year French I or SPAN 101 or GERM 101 or NORW 101 or CHIN 101 or RUSS 101</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 111 Introduction to Psychology (ES course &amp; Major requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Elective Course or Course in Minor</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
</tr>
</tbody>
</table>

Second Semester

| ENGL 130 Composition II: Writing for Public Audiences (ES Course & Major requirement) | 3 |
| COMM 110 Fundamentals of Public Speaking (ES Course & Major requirement) | 3 |
| FREN 102 First Year French II or SPAN 102 or GERM 102 or NORW 102 or CHIN 102 or RUSS 102 | 4 |
| PSYC 250 Developmental Psychology (ES Course & Major elective) | 4 |
| Elective Course or Course in Minor | 3-4 |
| Credits | 17-18 |

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester Credits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111 Concepts of Biology or BIOL 150 General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111L Concepts of Biology Laboratory or BIOL 150L General Biology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PSYC 241 Introduction to Statistics (ES Course &amp; Major requirement)</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 303 Research Methods in Psychology (Major requirement)</td>
<td>4</td>
</tr>
<tr>
<td>PSYC elective</td>
<td>3-4</td>
</tr>
<tr>
<td>Credits</td>
<td>15-16</td>
</tr>
</tbody>
</table>

Second Semester

| SOC 110 Introduction to Sociology (or another Social Science course that fulfills an ES requirement) | 3 |
| BIOL 151 General Biology II or ANAT 204 Anatomy for Paramedical Personnel | 3 |
| Credits | 15-16 |
Biology

BIOL 151L General Biology II Laboratory 1
or ANAT 204L Anatomy for Paramedical Personnel Laboratory
PSYC 270 Abnormal Psychology (ES course & Major elective) 3
PSYC 304 Advanced Research Methods (Major requirement for BS only) 3
PSYC elective 3-6
Elective Course or Course in Minor 3
Credits 19-22

Junior Year

First Semester
PSYC 320 Professional Development & Ethics (Major requirement) 1
Fine Arts (ES requirement) 3
PSYC elective 6
Elective Courses or Courses in Minor 6
Credits 16

Second Semester
PSYC 395 Practical Experiences in Psychology 2
or PSYC 475
or PSYC 493
or PSYC 494
Fine Arts (ES requirement) 3
PSYC elective 6-12
Credits 15-17

Senior Year

First Semester
PSYC 405 History and Systems of Psychology (ES capstone & Major requirement) 3
PSYC 400-level course 3-4
PSYC elective 3-4
Elective courses or courses in minor 6
Credits 15-17

Second Semester
PsyC 400-level Course (BA Requirement) 3-4
PsyC 43* Course (BS requirement) 4
PSYC elective 3-4
Elective Courses or Courses in Minor 6
Credits 16-18
Total Credits 128-143

Please see advisor for choosing electives. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Sociology

B. A. with Major in Sociology

Freshman Year

First Semester
SOC 110 Introduction to Sociology 3
ENGL 110 College Composition I 3
Credits in selected minor 3
Elective 3
Essential Studies: Global Diversity 3
Credits 15

Second Semester
ENGL 130 Composition II: Writing for Public Audiences 3
Essential Studies: Oral Communication 3
SOC 250 Diversity in American Society 3
Credits in selected minor 3
Elective 3
Credits 15

Sophomore Year

First Semester
SOC 301 Basic Sociological Theory 3
SOC 323 Sociological Research Methods 3
Credits in selected minor 3
Math/SC/Tech with Lab 4
Fine Arts or Humanities 3
Credits 16

Second Semester
Essential Studies: Math/Sci/Tech 3
SOC 326 Sociological Statistics 3
SOC 352 Aging and Society 3
Essential Studies: Fine Arts or Humanities 3
Credits in selected minor 3
Credits 15

Junior Year

First Semester
SOC 306 Social Change and Social Movements 3
Credits in selected minor 3
Fine Arts or Humanities 3
Social Science (Non Sociology) 3
Elective 3
Credits 15

Second Semester
SOC 431 Workplace Dynamics 2 3
Credits in selected minor 3
SOC 361 Social Psychology 3
Electives 13
Credits 22

Senior Year

First Semester
Credits in selected minor 3
Electives 9
Credits 12

Second Semester
SOC 436 Social Inequality 2 3
SOC 475 Sociology Capstone 3
Electives 9
Credits 15
Total Credits 125

1 = Or any Sociology elective. 2 = Or any Sociology course except 475, 492, and 494. A concentration of a minimum of 20 hours in a single supplementary field other than sociology is required of all sociology majors. Students may consider using free electives to add an additional major. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Theatre Arts

B.A. in Theatre Arts with a Major in Theatre Arts

First Year

First Semester
ENGL 110 College Composition I 3
THEA 161 Acting I 3
THEA 201 Theatre Practicum 1
THEA 270 Stagecraft 3
Credits 9
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Freshman Year</td>
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</tr>
<tr>
<td>Fall</td>
<td>ART 112 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ART 130 Drawing I</td>
<td>3</td>
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<td>Essential Studies Elective</td>
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<td>ART 114 Visual Persuasion</td>
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<tr>
<td>Spring</td>
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<td>Sophomore Year</td>
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<tr>
<td>Fall</td>
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<tr>
<td></td>
<td>Essential Studies Elective</td>
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<tr>
<td></td>
<td>ART 211 History of Art II</td>
<td>3</td>
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<tr>
<td>Junior Year</td>
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<tr>
<td>Fall</td>
<td>400 Level Art History</td>
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<td>300-400 Level Studio Art or Art History</td>
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<tr>
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<td>Essential Studies Elective</td>
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<td>Elective</td>
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<tr>
<td></td>
<td>Elective</td>
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</tbody>
</table>

Total Credits: 125

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
### B.F.A. with Major in Visual Arts - Ceramics Emphasis

#### Freshman Year

**Fall**
- ART 112 Basic Design 3
- ART 130 Drawing I 3
- ART 210 History of Art I 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

#### Spring

- Essential Studies Elective 3
- ART 114 Visual Persuasion 3
- ART 211 History of Art II 3
- ART 230 Drawing II 3

**Credits** 15

**Total Credits** 125

### B.F.A. with Major in Visual Arts - Jewelry & Metalsmithing Emphasis

#### Freshman Year

**Fall**
- ART 112 Basic Design 3
- ART 210 History of Art I 3
- ART 130 Drawing I 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

#### Spring

- Essential Studies Elective 3
- ART 114 Visual Persuasion 3
- ART 211 History of Art II 3
- ART 230 Drawing II 3

**Credits** 18

**Total Credits** 125

---

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
B.F.A. with Major in Visual Arts - Painting Emphasis

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ART 112 Basic Design</td>
<td>3</td>
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</table>

Sophomore Year

Fall

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<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
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</tr>
<tr>
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<tr>
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<tr>
<td>ART 212 Concepts of Art</td>
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<tr>
<td>ART 204 Jewelry and Metalsmithing I</td>
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Spring

<table>
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<tbody>
<tr>
<td>200 Level 3D Studio Art Course</td>
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<tr>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>ART 305 Jewelry and Metalsmithing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 273 Graphic Design Foundations</td>
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<tr>
<td>BFA Application</td>
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Junior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>400 Level Art History</td>
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<tr>
<td>200-300 Level 2D Studio Art Course</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>ART 114 Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 211 History of Art II</td>
<td>3</td>
</tr>
<tr>
<td>ART 230 Drawing II</td>
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Spring

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>200-300 Level 3D Studio Art Course</td>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>ART 221 Painting II</td>
<td>3</td>
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<tr>
<td>ART 273 Graphic Design Foundations</td>
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<tr>
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Senior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ART 401 Advanced Jewelry and Metalsmithing</td>
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<td>300-400 Level Studio Art or Art History</td>
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<tr>
<td>300-400 Level Studio Art or Art History</td>
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<tr>
<td>ART 490 Special Projects/ Independent Research (jewelry)</td>
<td>3</td>
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<tr>
<td>BFA Art Exhibition</td>
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Spring

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<tr>
<td>300-400 Level Studio Art or Art History</td>
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<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>ART 498 Seminar in Art and Design Capstone</td>
<td>3</td>
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<tr>
<td>BFA Art Exhibition</td>
<td>15</td>
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<tr>
<td>ART 401 Advanced Jewelry &amp; Metalsmithing</td>
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Spring

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<tr>
<td>300-400 Level Studio Art or Art History</td>
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<tr>
<td>Elective</td>
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<tr>
<td>ART 402 Advanced Painting</td>
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**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
## B.F.A. with Major in Visual Arts - Drawing Emphasis

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 112  Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 130  Drawing I</td>
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</tr>
<tr>
<td>ART 210  History of Art I</td>
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| Essential Studies Elective | 3 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 114  Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 211  History of Art II</td>
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</table>

| ART 230  Drawing II        | 3       |

| Essential Studies Elective | 3 |

| Credits                   | 15 |

### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tr>
<td>200 Level 2D Studio Art Course</td>
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<tr>
<td>ART 212  Concepts of Art</td>
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<tr>
<td>ART 430  Advanced Drawing</td>
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| Essential Studies Elective | 3 |

| Essential Studies Elective | 3 |

| Credits                   | 18 |

### Junior Year

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<thead>
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<tr>
<td>Essential Studies Elective</td>
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<tr>
<td>400 Level Art History</td>
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<td>200-300 Level 2D Studio Art Course</td>
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</table>

| ART 430  Advanced Drawing | 3       |

| Essential Studies Elective | 3 |

| Credits                   | 15 |

### Senior Year

<table>
<thead>
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<td>300-400 Level Studio Art or Art History</td>
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| ART 498  Seminar in Art and Design Capstone | 3 |

| Elective                  | 3 |

| Credits                   | 15 |

## B.F.A. with Major in Visual Arts - Fibers

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
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</thead>
<tbody>
<tr>
<td>ART 112  Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 130  Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 210  History of Art I</td>
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| Essential Studies Elective | 3 |

| Credits                   | 15 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 114  Visual Persuasion</td>
<td>3</td>
</tr>
<tr>
<td>ART 211  History of Art II</td>
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</table>

| ART 230  Drawing II        | 3       |

| Essential Studies Elective | 3 |

| Credits                   | 15 |

### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>200 Level 2D Studio Art Course</td>
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<tr>
<td>Essential Studies Elective</td>
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<tr>
<td>ART 273  Graphic Design Foundations</td>
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| Essential Studies Elective | 3 |

| Credits                   | 18 |

### Junior Year

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<td>Essential Studies Elective</td>
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<tr>
<td>400 Level Art History</td>
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<td>200-300 Level 3D Studio Art Course</td>
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| ART 430  Advanced Drawing | 3       |

| Essential Studies Elective | 3 |

| Elective                  | 2 |

| Credits                   | 17 |

### Senior Year

<table>
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<tr>
<td>400 Level Art History</td>
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<tr>
<td>200-300 Level 2D Studio Art Course</td>
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| Essential Studies Elective | 3 |

| Essential Studies Elective | 3 |

| ART 406  Advanced Fibers  | 3 |

| Credits                   | 15 |
B.F.A. with Major in Visual Arts - Photography Emphasis

Freshman Year

Fall
ART 112 Basic Design 3
ART 210 History of Art I 3
ART 130 Drawing I 3
Essential Studies Elective 3
Essential Studies Elective 3

Credits 15

Spring
Essential Studies Elective 3
Essential Studies Elective 3
ART 114 Visual Persuasion 3
ART 230 Drawing II 3

Credits 15

Total Credits 125

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.F.A. with Major in Visual Arts - Printmaking Emphasis

Freshman Year

Fall
ART 112 Basic Design 3
ART 210 History of Art I 3
ART 130 Drawing I 3
Essential Studies Elective 3
Essential Studies Elective 3

Credits 15

Spring
Essential Studies Elective 3
Essential Studies Elective 3
ART 114 Visual Persuasion 3
ART 230 Drawing II 3

Credits 15

Total Credits 125

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
### Sophomore Year

**Fall**
- 200 Level 2D Studio Art Course 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- ART 212 Concepts of Art 3
- ART 240 Printmaking I 3

**Credits** 18

**Spring**
- 200 Level 3D Studio Art Course 3
- ART 273 Graphic Design Foundations 3
- ART 340 Printmaking II 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

### Junior Year

**Fall**
- ART 403 Advanced Printmaking 3
- 400 Level Art History 3
- 200-300 Level 2D Studio Art Course 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

**Spring**
- 200-300 Level 3D Studio Art Course 3
- 400 Level Art History 3
- ART 494 Professional Exhibition 3
- ART 403 Advanced Printmaking 3
- Essential Studies Elective 3
- Elective 3

**Annual BFA Review**

**Credits** 17

### Senior Year

**Fall**
- 300-400 Level Studio Art or Art History 3
- 300-400 Level Studio Art or Art History 3
- Elective 3
- ART 490 Special Projects/ Independent Research 3
- ART 403 Advanced Printmaking 3

**Credits** 15

**Spring**
- ART 498 Seminar in Art and Design Capstone 3
- Elective 3
- 300-400 Level Studio Art or Art History 3
- 300-400 Level Studio Art or Art History 3
- ART 403 Advanced Printmaking 3

**BFA Art Exhibition**

**Credits** 15

**Total Credits** 125

---

**B.F.A. with Major in Visual Arts - Sculpture Emphasis**

### Freshman Year

**Fall**
- ART 112 Basic Design 3
- ART 130 Drawing I 3
- ART 210 History of Art I 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

**Spring**
- ART 114 Visual Persuasion 3
- ART 211 History of Art II 3
- ART 230 Drawing II 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 15

### Sophomore Year

**Fall**
- 200 Level 2D Studio Art Course 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- ART 212 Concepts of Art 3
- ART 200 Sculpture I 3

**Credits** 15

**Spring**
- ART 273 Graphic Design Foundations 3
- ART 301 Sculpture II 3
- 200 Level 3D Studio Art Course 3
- Essential Studies Elective 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Annual BFA Review**

**Credits** 18

### Junior Year

**Fall**
- ART 400 Advanced Sculpture 3
- 400 Level Art History 3
- 200-300 Level 2D Studio Art Course 3
- Essential Studies Elective 3
- Essential Studies Elective 3

**Credits** 17

**Spring**
- ART 494 Professional Exhibition 3
- ART 400 Advanced Sculpture 3
- 200-300 Level 3D Studio Art Course 3
- Annual BFA Review 3
- 400 Level Art History 3
- Essential Studies Elective 3
- Elective 3

**Credits** 18

### Senior Year

**Fall**
- ART 400 Advanced Sculpture 3
- ART 490 Special Projects/ Independent Research 3
- 300-400 Level Studio Art or Art History 3
- 300-400 Level Studio Art or Art History 3
- Elective 3

**Credits** 15

---

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
Spring
300-400 Level Studio Art or Art History 3
300-400 Level Studio Art or Art History 3
ART 498 Seminar in Art and Design Capstone 3
Elective 3
BFA Art Exhibition
ART 400 Advanced Sculpture 3
Credits 12
Total Credits 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

B.A. with Major in Visual Arts - Time-based Media Emphasis

Freshman Year
Fall Credits
ART 112 Basic Design 3
ART 210 History of Art I 3
ART 130 Drawing I 3
Essential Studies Elective 3
Essential Studies Elective 3
Credits 15

Spring
Essential Studies Elective 3
Essential Studies Elective 3
ART 114 Visual Persuasion 3
ART 211 History of Art II 3
ART 230 Drawing II 3
Credits 15

Sophomore Year
Fall Credits
200 Level 2D Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 272 Time-based Media I - Time Design and Digital Media 3
ART 212 Concepts of Art 3
Credits 18

Spring
200 Level 3D Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 273 Graphic Design Foundations 3
ART 380 Time-based Media II - Digital Video 3
Credits 15

Junior Year
Fall Credits
400 Level Art History 3
200-300 Level 2D Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 381 Time-based Media III - Motion Graphics 3
Credits 15

Spring
400 Level Art History 3
200-300 Level 3D Studio Art Course 3
Essential Studies Elective 3
Elective 2

B.A. with Major in Visual Arts

Freshman Year
Fall Credits
ART 112 Basic Design 3
ART 130 Drawing I 3
Essential Studies Elective 3
Essential Studies Elective 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 483 Advanced Time-based Media: Alternative Presentation of Media 3
ART 498 Seminar in Art and Design Capstone 3
Credits 15
Total Credits 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Visual Arts

ART 494 Professional Exhibition 3
ART 490 Special Projects/ Independent Research (Time-based Media) 3
Credits 17

Senior Year
Fall
300-400 Level Studio Art or Art History 3
300-400 Level Studio Art or Art History 3
Elective 3
ART 383 Time-based Media IV - Animation 3
ART 490 Special Projects/ Independent Research (Time-based Media) 3
Credits 15
Total Credits 125

Spring
300-400 Level Studio Art or Art History 3
300-400 Level Studio Art or Art History 3
Elective 3
ART 483 Advanced Time-based Media: Alternative Presentation of Media 3
ART 498 Seminar in Art and Design Capstone 3
Credits 15
Total Credits 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
Junior Year
Fall
400 Level Art History 3
300-400 Level Studio Art or Art History 3
Elective 3
Elective 3
Elective 3
Credits 15

Spring
300-400 Level Studio Art Course 3
Elective 3
Elective 3
Elective 3
Elective 2
300-400 Level Studio Art Course 3
Credits 17

Senior Year
Fall
300-400 Level Studio Art or Art History 3
Elective 3
Elective 3
300-400 Level Studio Art or Art History 3
Credits 15

Spring
Elective 3
Elective 3
Elective 3
ART 498 Seminar in Art and Design Capstone 3
Elective 3
Credits 15

Total Credits 125

**Vocal Performance**

**B.M. with Major in Vocal Performance (Even Fall Entry)**

**B.M. with Major in Vocal Performance (Odd Fall Entry)**

**B.M. with Major in Vocal Performance (Even Fall Entry)**

**Freshman Year**

**Fall**

MUSC 130 Music Theory I 3
MUSC 133 Keyboard Skills I or MUSC 154 1
MUSC 131 Aural Skills I 1
ENGL 110 College Composition I 3
Essential Studies Lab Science 4
Major Ensemble 1
MUSC 155 Individual Lessons 2
Credits 15

**Spring**

Electives 3
MUSC 135 Aural Skills II 1
Essential Studies Social Science 3
Major Ensemble 1

**Sophomore Year**

**Fall**

MUSC 233 Keyboard Skills III or MUSC 254 1
MUSC 255 Individual Lessons 2
COMM 110 Fundamentals of Public Speaking 3
FREN 101 or GERM 101 First Year French I or First Year German I 4
Major Ensemble 1
MUSC 256 Basic Conducting 2
MUSC 231 Aural Skills III 1
MUSC 230 Music Theory III 3
Credits 17

**Spring**

MUSC 235 Aural Skills IV 1
FREN 102 or GERM 102 First Year French II or First Year German II 4
MUSC 234 Music Theory IV: Music Theory since 1900 3
MUSC 255 Individual Lessons 2
MUSC 203 Music and Culture 3
Major Ensemble 1
MUSC 236 or MUSC 254 Keyboard Skills IV or Individual Lessons 1
Credits 15

**Junior Year**

**Fall**

Chamber Ensemble 1
Music Electives 3
Major Ensemble 1
Essential Studies Social Science (U) 3
MUSC 355 Individual Lessons 4
MUSC 310 Music History Survey I 3
MUSC 444 Applied Music Pedagogy 2
Credits 17

**Spring**

MUSC 355 Individual Lessons 4
Essential Studies Math/Science/Technology 3
MUSC 359 Junior Recital 1
Music Electives 3
MUSC 311 Music History Survey II 3
Major Ensemble 1
MUSC 269 Opera Workshop 1
Credits 16

**Senior Year**

**Fall**

Chamber Ensemble 1
Essential Studies Social Science 3
Major Ensemble 1
MUSC 455 Individual Lessons 4
MUSC 242 Diction for Singers (English/French) 1
MUSC 415 Vocal Literature 2
Essential Studies Math/Science/Technology (Q) 3
Credits 15

**Spring**

MUSC 242 Diction for Singers (Italian/German) 1
Electives 2

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B.M. with Major in Vocal Performance (Odd Fall Entry)

Freshman Year

Fall

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<tbody>
<tr>
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<tr>
<td>MUSC 131 Aural Skills I</td>
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<tr>
<td>Essential Studies Lab Science</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<td>MUSC 130 Music Theory I</td>
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<td>MUSC 133 Keyboard Skills I ^KS</td>
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<td>or MUSC 154 Individual Lessons</td>
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Credits 15

Spring

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<td>MUSC 155 Individual Lessons</td>
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<td>MUSC 135 Aural Skills II</td>
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<td>MUSC 134 Music Theory II</td>
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<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<tr>
<td>Major Ensemble</td>
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<td>MUSC 136 Keyboard Skills II</td>
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Credits 14

Sophomore Year

Fall

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<tbody>
<tr>
<td>FREN 101 First Year French I</td>
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<td>or GERM 101 First Year German I</td>
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<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
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<tr>
<td>Major Ensemble</td>
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<tr>
<td>MUSC 256 Basic Conducting</td>
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<td>MUSC 255 Individual Lessons</td>
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<tr>
<td>MUSC 231 Aural Skills III</td>
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<td>MUSC 230 Music Theory III</td>
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<tr>
<td>MUSC 233 Keyboard Skills III</td>
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<tr>
<td>or MUSC 254 Individual Lessons</td>
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Credits 17

Spring

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<tbody>
<tr>
<td>MUSC 234 Music Theory IV: Music Theory since 1900</td>
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<tr>
<td>MUSC 235 Aural Skills IV</td>
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<td>MUSC 236 Keyboard Skills IV</td>
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<tr>
<td>or MUSC 254 Individual Lessons</td>
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<tr>
<td>MUSC 255 Individual Lessons</td>
<td>2</td>
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<tr>
<td>MUSC 203 Music and Culture</td>
<td>3</td>
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<tr>
<td>FREN 102 First Year French II</td>
<td>4</td>
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<td>or GERM 102 First Year German II</td>
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Credits 15

Student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

College of Business and Public Administration

B.ACC in Accountancy (p. 307)
B.B.A. with Major in Airport Management (p. 308)
B.B.A. with Major in Aviation Management (p. 309)
B.B.A. with Major in Banking & Financial Economics (p. 310)
B.B.A. with Major in Business Economics (p. 310)
B.B.A. with Major in Entrepreneurship (p. 311)
B.S. with Major in Graphic Design Technology (p. 312)
B.B.A. with Major in Human Resource Management (p. 313)
B.S in Industrial Technology (p. 313)
B.B.A. with Major in Information Systems (p. 314)
B.B.A. with Major in Investments (p. 314)
B.A. with Major in Management (p. 315)
B.B.A. with Major in Managerial Finance & Accounting (p. 316)
B.B.A. with Major in Marketing (p. 316)
B.B.A. with Major in Operations and Supply Chain Management (p. 318)
B.A. with Major in Political Science (p. 318)
B.S. with Major in Public Administration (p. 318)

Accountancy
B.ACC in Accountancy (CPA Track) (p. 307)
B.ACC in Accountancy (Non-CPA track)

B.ACC in Accountancy (CPA Track)

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<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
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<td>MATH 103</td>
<td>College Algebra</td>
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<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
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<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<td>or SOC 110</td>
<td>or Introduction to Sociology</td>
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<tr>
<td>or ANTH 171</td>
<td>or Introduction to Cultural Anthropology</td>
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<td>Credits 15</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
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<td>Essential Studies: Arts or Humanities</td>
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<td>Essential Studies: Lab Science</td>
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<td>ACCT 200</td>
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<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
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<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<tr>
<td>Credits</td>
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| Spring | |
| Essential Studies/Special Emphasis: United States Diversity | 3 |
| ACCT 201 | Elements of Accounting II | 3 |
| ACCT 218 | Advanced Spreadsheet Applications | 3 |
| ECON 202 | Principles of Macroeconomics | 3 |
| ECON 210 | Introduction to Business and Economic Statistics | 3 |
| Open Elective | 1 |
| Credits | 16 |

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<td>ACCT 301</td>
<td>Intermediate Accounting I</td>
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B.ACC in Accountancy (CPA Track)

| Fall | Credits |
| ACCT 320 | Cost Accounting | 3 |
| MGMT 300 | Principles of Management | 3 |
| ISBC 317 | | 3 |
| MRKT 305 | Marketing Foundations | 3 |
| Spring | Credits 13 |
| ACCT 397 | Cooperative Education | 7 |

If you are on campus this semester, you can continue taking courses starting with the senior year fall semester list.

| Senior Year | Fall | Credits |
| ACCT 302 | Intermediate Accounting II | 3 |
| ACCT 309 | Accounting Information Systems | 3 |
| ACCT 315 | Business Law I | 3 |
| FIN 310 | Principles of Financial Management | 3 |
| Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits) | 6 |

| Spring | Credits 18 |
| ACCT 405 | Assurance Services | 3 |
| ECON 303 | Money and Banking | 3 |
| Accounting Elective | (If you plan on taking the CPA exam it is recommended that you take Acct 312, Acct 406, & Acct 410. However, you only need to take two of these classes to graduate with a BACC degree) | 3 |
| Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits) | 6 |
| MGMT 301 | Operations Management | 3 |

| Fifth Year | Fall | Credits 18 |
| Essential Studies/Special Emphasis: Advanced Communication | 3 |
| ACCT 316 | Business Law II | 3 |
| ACCT 401 | Advanced Accounting | 3 |
| ACCT 411 | Business Income Taxation | 3 |
| Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits) | 6 |

| Spring | Credits 15 |
| ACCT 450 | Contemporary Issues in Accounting | 3 |
| MGMT 475 | Strategic Management | 3 |
| Accounting Elective | (If you plan on taking the CPA exam it is recommended that you take Acct 312, Acct 406, & Acct 410. However, you only need to take two of these classes to graduate with a BACC degree) | 3 |

| Credits | 15 |
| Total Credits | 153 |

1. You must complete enough open electives to bring total credit hours up to 126.

Students pursuing a second degree in Managerial Finance and Accounting need at least 157 credits to graduate.

Special Emphasis courses can fulfill an essential studies requirement (example: History 104 will count toward the US Diversity as well as the Humanities area.)
Airport Management

B.ACC in Accountancy (Non-CPA track)

Freshman Year

Fall

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<td>MATH 103</td>
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<tr>
<td>POLS 115</td>
<td>3</td>
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<td>PSYC 111 or SOC 110 or ANTH 171</td>
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Essential Studies: Fine Arts 3

Spring

Essential Studies/Special Emphasis: Global Diversity 3

Sophomore Year

Fall

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<td>ECON 201</td>
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<td>ISBC 117</td>
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Essential Studies: Lab Science 4

Spring

Essential Studies/Special Emphasis: United States Diversity 3

Junior Year

Fall

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<td>ACCT 320</td>
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<td>MGMT 300</td>
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Spring

Open Elective 1

Senior Year

Fall

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Spring

Essential Studies: US Diversity 3

B.A. with Major in Airport Management

Freshman Year

Fall

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<td>MATH 103</td>
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<td>POLS 115</td>
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<td>ATSC 110</td>
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Spring

ACCT 316 Business Law II 3

ECON 303 Money and Banking 3

2 The following courses count as accounting electives: Acct. 312, 403, 406, 410, 412, and 416.

Special Emphasis courses can fulfill an essential studies requirement (example - History 104 will count toward the US Diversity as well as the Humanities area).

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Airport Management

Senior Year

Fall

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<th>Course</th>
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<td>FIN 310</td>
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Spring

AVIT 102 Introduction to Aviation 5

ENGL 130 Composition II: Writing for Public Audiences 3

MATH 146 Applied Calculus I 3

AVIT 103 Introduction to Air Traffic Control 2

Essential Studies: Fine Arts & Humanities (FA) 3

Credits 16

Sophomore Year

Fall

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<th>Course</th>
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<td>ISBC 117</td>
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Spring

ISBC 217 Fundamentals of Computer Information Systems 3

ECON 202 Principles of Microeconomics 3

ACCT 201 Elements of Accounting II 3

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
### Aviation Management

**B.B.A. with Major in Aviation Management**

#### Freshman Year

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<td>AVIT 102 Introduction to Aviation</td>
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<td>ATSC 110 Meteorology I</td>
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<td>AVIT 100 Aviation Orientation</td>
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</table>

| Credits | 16 |

#### Spring

| ENGL 130 Composition II: Writing for Public Audiences | 3 |
| MATH 146 Applied Calculus I | 3 |

You must complete enough electives to bring total credit hours up to 125.

Special Emphasis courses can fulfill an essential studies requirement (example - History 104, US History, will count toward the US Diversity as well as the Humanities area). Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### University of North Dakota

---

**ECON 210 Introduction to Business and Economic Statistics** 3

**Essential Studies: Arts or Humanities (FA or HUM)** 3

<table>
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<th>Junior Year</th>
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<tbody>
<tr>
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<tr>
<td>MRKT 305 Marketing Foundations</td>
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<td>AVIT 250 Human Factors</td>
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<td>ISBC 305 End-User Applications</td>
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<td>MGMT 300 Principles of Management</td>
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<td>MGMT 301 Operations Management</td>
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| Credits | 15 |

**Spring**

| MGMT 302 Human Resource Management | 3 |
| FIN 310 Principles of Financial Management | 3 |
| AVIT 311 Safety Management System (SMS) | 3 |
| AVIT 405 Airline Operations and Management or AVIT 407 | 3 |
| Essential Studies: Global Diversity | 3 |

| Credits | 16 |

**Senior Year**

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<tr>
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<td>AVIT 402 Airport Planning and Administration</td>
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<td>ECON 303 Money and Banking</td>
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<td>MGMT 310 Organizational Behavior</td>
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| Credits | 15 |

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<td>AVIT 485 Aviation Senior Capstone</td>
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<td>GEOL 103 Introduction to Environmental Issues</td>
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<tr>
<td>POLS 308 Intergovernmental Relations or POLS 404 or POLS 432</td>
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| Credits | 15 |

| Total Credits | 125 |

1 = You must complete enough electives to bring total credit hours up to the 125.
Special Emphasis courses can fulfill an essential studies requirement (example-History 104, US History, will count toward the US Diversity as well as the Humanities area).

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### Banking & Financial Economics

#### B.B.A. with Major in Banking & Financial Economics

#### Freshman Year

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<td>POLS 115</td>
<td>American Government I</td>
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<td>PSYC 111</td>
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<td>Fundamentals of Public Speaking</td>
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<td>ENGL 130</td>
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#### Sophomore Year

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<td>Principles of Microeconomics</td>
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<td>Elements of Accounting II</td>
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#### Junior Year

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<td>FIN 310</td>
<td>Principles of Financial Management</td>
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<tbody>
<tr>
<td>ACCT 315</td>
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#### Senior Year

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**Total Credits**: 125

#### Business Economics

#### B.B.A. with Major in Business Economics

#### Freshman Year

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<tbody>
<tr>
<td>ENGL 130</td>
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<tr>
<td>COMM 110</td>
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#### Sophomore Year

<table>
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<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
</tr>
<tr>
<td>Essential Studies: Lab Science</td>
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<tbody>
<tr>
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#### Junior Year

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<tbody>
<tr>
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<tr>
<td>ECON 438</td>
<td>International Money and Finance</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
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<tr>
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<td>ECON 201</td>
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<td>Essential Studies: Arts &amp; Humanities (HUM)</td>
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#### Senior Year

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<td>FIN 310</td>
<td>Principles of Financial Management</td>
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<tr>
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<td>MGMT 300</td>
<td>Principles of Management</td>
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<td>MRKT 305</td>
<td>Marketing Foundations</td>
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Economics

B.B.A. with Major in Business Economics

Freshman Year

Fall

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<td>POLS 115</td>
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| Total Credits            | 15      |

Spring

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| Essential Studies/Special Emphasis: United States Diversity | 1 |

| Total Credits            | 15      |

Sophomore Year

Fall

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| Essential Studies: Arts & Humanities | 3 |

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Spring

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| Total Credits            | 18      |

Junior Year

Fall

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| Total Credits            | 15      |

Spring

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| Total Credits            | 15      |

Senior Year

Fall

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| Electives               | 3       |

| Total Credits            | 15      |

Spring

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<tbody>
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| ECON Electives          | 6       |

| Total Credits            | 15      |

Total Credits: 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Entrepreneurship

B.B.A. with Major in Entrepreneurship

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
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| Essential Studies/Special Emphasis: United States Diversity | 3 |

| Total Credits            | 15      |

Spring

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
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<tr>
<td>MATH 146</td>
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| Essential Studies: Fine Arts & Humanities (HUM) | 3 |

| Essential Studies/Special Emphasis: Global Diversity | 3 |

| Total Credits            | 15      |

Sophomore Year

Fall

<table>
<thead>
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| Total Credits            | 15      |

Spring

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| Total Credits            | 18      |

Total Credits: 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
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<td>TECH 102</td>
<td>Digital Design Software</td>
<td>4</td>
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<td>TECH 122</td>
<td>Computer-Aided Design</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<td>Essential Studies Lab Sciences</td>
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<td>TECH 112</td>
<td>Graphic Design Software and Technologies II</td>
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<td>TECH 202</td>
<td>Advanced Application of CADD Techniques</td>
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<td>Sophomore Year</td>
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<td>Computers and Emerging Technologies</td>
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<td>ENTR 201</td>
<td>The Entrepreneur and the Enterprise</td>
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<td>Junior Year</td>
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**Graphic Design Technology**

**B.S. with Major in Graphic Design Technology**

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<th>Course Title</th>
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<tr>
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<td>TECH 102</td>
<td>Digital Design Software</td>
<td>4</td>
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<td>Computer-Aided Design</td>
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<td>Fall</td>
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<td>Computers and Emerging Technologies</td>
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<td>ENTR 201</td>
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<td>TECH 300</td>
<td>Technology and Society</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENTR 306</td>
<td>Accounting and Financial Concepts for</td>
<td>3</td>
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<tr>
<td></td>
<td>Entrepreneurship</td>
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<tr>
<td>Junior Year</td>
<td></td>
<td></td>
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<tr>
<td>Fall</td>
<td>Essential Studies Social Science</td>
<td>See list of recommended courses below</td>
<td>3</td>
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<tr>
<td></td>
<td>TECH 362</td>
<td>Intermediate Graphic Design and Print</td>
<td>3</td>
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<tr>
<td></td>
<td>Open Elective</td>
<td>You must complete enough open electives to bring the total credit hours to 125</td>
<td>3</td>
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<tr>
<td></td>
<td>ENTR 305</td>
<td></td>
<td>3</td>
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<td>TECH 332</td>
<td>Industrial Design</td>
<td>3</td>
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<td></td>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
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<td>You must complete enough open electives to bring the total credit hours to 125</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Essential Studies/Special Emphasis: United States Diversity</td>
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<td>Open Elective</td>
<td>You must complete enough open electives to bring the total credit hours to 125</td>
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<td>ENTR 366</td>
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<td>TECH 342</td>
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<tr>
<td>Senior Year</td>
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<tr>
<td>Fall</td>
<td>TECH 322</td>
<td>Fundamentals of Photography (Essential Studies/FA)</td>
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<td></td>
<td>Essential Studies/Special Emphasis: Advanced Communication</td>
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<td></td>
<td>Essential Studies Social Science (see recommended list below)</td>
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<tr>
<td></td>
<td>TECH 442</td>
<td>Industrial/Applied Graphic Design</td>
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<td></td>
<td>TECH 498</td>
<td>Senior Capstone I</td>
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<tr>
<td></td>
<td>ENTR 385</td>
<td></td>
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<td><strong>Total Credits</strong></td>
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</table>
### Human Resource Management

#### B.B.A. with Major in Human Resource Management

**Freshman Year**
- **Fall**
  - MATH 103 College Algebra 3
  - ENGL 110 College Composition I 3
  - PSYC 111 Introduction to Psychology 3
  - POLS 115 American Government I 3
  - Essential Studies: Fine Arts and Humanities (FA) 3
  - **Credits**: 15

- **Spring**
  - COMM 110 Fundamentals of Public Speaking 3
  - ENGL 130 Composition II: Writing for Public Audiences 3
  - MATH 146 Applied Calculus I 3
  - SOC 110 Introduction to Sociology (U) 3
  - Or
  - ANTH 171 Introduction to Cultural Anthropology (G) 3
  - Essential Studies: Fine Arts and Humanities (Hum) 3
  - Elective 3
  - **Credits**: 15

**Sophomore Year**
- **Fall**
  - ECON 201 Principles of Microeconomics 3
  - ACCT 200 Elements of Accounting I 3
  - Essential Studies: Lab Science 4
  - Essential Studies: Fine Arts and Humanities (U or G) 3
  - ISBC 117 Personal Productivity with Information Technology 3
  - Elective 3
  - **Credits**: 17

- **Spring**
  - ECON 202 Principles of Macroeconomics 3
  - ACCT 201 Elements of Accounting II 3
  - ECON 210 Introduction to Business and Economic Statistics 3
  - MGMT 300 Principles of Management 3
  - Elective 3
  - **Credits**: 15

**Junior Year**
- **Fall**
  - MGMT 301 Operations Management 3
  - MGMT 302 Human Resource Management 3
  - MRKT 305 Marketing Foundations 3
  - Special Emphasis: Advanced Communication 3
  - ISBC 217 Fundamentals of Computer Information Systems 3
  - **Credits**: 15

- **Spring**
  - FIN 310 Principles of Financial Management 3
  - MGMT 310 Organizational Behavior 3
  - ECON 303 Money and Banking 3
  - ACCT 315 Business Law I 3
  - **Credits**: 15

**Senior Year**
- **Fall**
  - MGMT 412 Training and Development 3
  - MGMT 407 Wage and Salary Administration 3
  - Human Resource Management Elective 3
  - Human Resource Management Elective 3
  - Elective 3
  - **Credits**: 15

- **Spring**
  - Elective 3
  - MGMT 400 Organizational Theory and Analysis 3
  - MGMT 408 Issues in Human Resource Management 3
  - MGMT 410 Staffing: Recruitment and Selection 3
  - MGMT 475 Strategic Management 3
  - **Credits**: 15

**Total Credits**: 128

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

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### Industrial Technology

#### B.S in Industrial Technology

**Freshman Year**
- **Fall**
  - TECH 110 Fundamentals of Technology 2
  - TECH 122 Computer-Aided Design 3
  - MATH 103 College Algebra 3
  - PHYS 161 Introductory College Physics I 4
  - ENGL 110 College Composition I 3
  - **Credits**: 15

- **Spring**
  - TECH 202 Advanced Application of CADD Techniques 3
  - TECH 203 Production Processes & Material Testing 3
  - MATH 105 Trigonometry 2
  - PHYS 162 Introductory College Physics II 4
  - ENGL 130 Composition II: Writing for Public Audiences 3
  - **Credits**: 15

**Sophomore Year**
- **Fall**
  - MATH 146 Applied Calculus I 3
  - ECON 210 Introduction to Business and Economic Statistics 3
  - TECH 201 Electromechanical Fundamentals 3
  - TECH 204 Industrial Materials 4
  - **Credits**: 13

- **Spring**
  - TECH 330 Quality Assurance 3
  - MGMT 300 Principles of Management 3
  - PHIL 250 Ethics in Engineering and Science (6 Credits of Essential Studies) 3
  - ISBC 117 Personal Productivity with Information Technology 1
  - LEAD 101 Learning Leadership 3
  - TECH 211 Electric Circuits and Devices 3
  - **Credits**: 16

**Junior Year**
- **Fall**
  - TECH 332 Industrial Design 3
  - TECH 433 Manufacturing Strategies 3

---

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
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<tr>
<td>TECH 223</td>
<td>Applied Synthetics</td>
<td>3</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>3</td>
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<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Spring</td>
<td></td>
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<tr>
<td>TECH 300</td>
<td>Technology and Society</td>
<td>3</td>
</tr>
<tr>
<td>TECH 340</td>
<td>Cost Estimating</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
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<tr>
<td>TECH 373</td>
<td>Advanced Manufacturing Processes (Select this</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>course if pursuing an emphasis in Manufacturing</td>
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<td>Technologies)</td>
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<td>Senior Year</td>
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<td>Fall</td>
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</tr>
<tr>
<td>TECH 498</td>
<td>Senior Capstone I</td>
<td>1</td>
</tr>
<tr>
<td>TECH 403</td>
<td>Product Research and Development</td>
<td>3</td>
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<tr>
<td>ENTR 305</td>
<td></td>
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<tr>
<td>Essential Studies</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Spring</td>
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<tr>
<td>TECH 440</td>
<td>Occupational Safety</td>
<td>3</td>
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<tr>
<td>TECH 499</td>
<td>Senior Capstone II</td>
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<td>TECH 420</td>
<td>Facilities Design</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Total Credits</strong></td>
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</table>

Student can pursue courses as a generalist or with emphasis in Electronics or Manufacturing. Tech 223, 204, 213 and 403 for a Manufacturing emphasis. Tech 311, 341, and 451 for Electronics emphasis. Select a mix from the two when pursuing the Generalist option. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

### Information Systems

#### B.B.A. with Major in Information Systems

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Arts &amp; Humanities (FA)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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**Spring**

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<thead>
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<th>Course Name</th>
<th>Credits</th>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Arts &amp; Humanities (HUM)</td>
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<tr>
<td>Essential Studies: US Diversity</td>
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**Sophomore Year**

**Fall**

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<td>Principles of Microeconomics</td>
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<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<tr>
<td>Essential Studies: Fine Arts &amp; Humanities</td>
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<td>Essential Studies: Lab Science</td>
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**Spring**

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<th>Course Name</th>
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<td>ISBC 317</td>
<td>Professional Communication for Business</td>
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<td>ISBC 320</td>
<td>Database Design</td>
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<tr>
<td>ISBC 340</td>
<td>Fundamentals of Networking</td>
<td>3</td>
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<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
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**Junior Year**

**Fall**

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<tr>
<td>ISBC 410</td>
<td>Information Security</td>
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<td>ISBC 430</td>
<td>Database Programming</td>
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<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
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<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
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<td>ISBC 451</td>
<td>Networking III (ISBC Elective Course)</td>
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**Spring**

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<tr>
<td>ISBC 490</td>
<td>Information Systems Analysis and Design Seminar</td>
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<td>ISBC 471</td>
<td>Advanced Information Systems Programming(ISBC Elective course)</td>
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<td>ISBC 431</td>
<td>Database Administration and Optimization(ISBC Elective course)</td>
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<td>ISBC 361</td>
<td>Records and Information Management(ISBC Elective course)</td>
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<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
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**Senior Year**

**Fall**

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<tbody>
<tr>
<td>ISBC Elective courses (total of 9 credits required for graduation)</td>
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**Spring**

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ISBC Elective courses (total of 9 credits required for graduation)</td>
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### Investments

#### B.B.A. with Major in Investments

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111 or SOCI 110 or ANTH 171</td>
<td>Introduction to Psychology or Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>Essential Studies: Fine Arts</td>
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<td><strong>Credits</strong></td>
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</table>

**Investments**

**B.B.A. with Major in Investments**

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<td>PSYC 111 or SOCI 110 or ANTH 171</td>
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</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
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</tbody>
</table>
### Spring
- Essential Studies/Special Emphasis: Global Diversity 3
- COMM 110 Fundamentals of Public Speaking 3
- MATH 146 Applied Calculus I 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- Essential Studies: Humanities 3

**Credits** 15

### Sophomore Year

#### Fall
- ECON 201 Principles of Microeconomics 3
- ACCT 200 Elements of Accounting I 3
- ISBC 117 Personal Productivity with Information Technology 1
- Elective 1
- Essential Studies: Arts & Humanities 3
- Essential Studies: Lab Science 4

**Credits** 15

#### Spring
- Essential Studies/Special Emphasis: United States Diversity 3
- ACCT 201 Elements of Accounting II 3
- ECON 202 Principles of Macroeconomics 3
- ECON 210 Introduction to Business and Economic Statistics 3
- ACCT 218 Advanced Spreadsheet Applications 3
- Elective 1

**Credits** 16

### Junior Year

#### Fall
- FIN 310 Principles of Financial Management 3
- ACCT 301 Intermediate Accounting I 3
- MGMT 300 Principles of Management 3
- MRKT 305 Marketing Foundations 3
- ISBC 317 3
- Elective 1

**Credits** 16

#### Spring
- Essential Studies/Special Emphasis: Advanced Communication 3
- MGMT 301 Operations Management 3
- FIN 340 Intermediate Financial Management 3
- FIN 360 Capital Market Financing and Investment Strategies 3
- FIN 370 Student Investment Fund I 1
- Finance Elective 3

**Credits** 18

### Senior Year

#### Fall
- ISBC 217 Fundamentals of Computer Information Systems 3
- MRKT 305 Marketing Foundations 3
- ECON 303 Money and Banking 3
- MGMT 301 Operations Management 3
- MGMT 302 Human Resource Management 3
- Elective 3

**Credits** 15

#### Spring
- FIN 420 Investment Analysis and Portfolio Management 3
- ECON 303 Money and Banking 3
- MGMT 475 Strategic Management 3
- Elective 1
- FIN 415 Fixed Income Analysis and Portfolio Management 3
- Finance Elective 3

**Credits** 16

**Total Credits** 125

1 = You must complete enough electives to bring total credit hours up to 125.
2 = Only offered Fall Semester.
3 = Only offered Spring Semester. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies-requirements.cfm

Special Emphasis courses can fulfill an essential studies requirement (example - History 104 will count toward the US Diversity as well as the Humanities area).

## Management

### B.B.A. with Major in Management

#### Freshman Year

##### Fall
- ENGL 110 College Composition I 3
- POLS 115 American Government I 3
- PSYC 111 Introduction to Psychology 3
- MATH 103 College Algebra 3
- Essential Studies: Fine Arts and Humanities (FA) 3

**Credits** 15

##### Spring
- COMM 110 Fundamentals of Public Speaking 3
- Essential Studies: Fine Arts and Humanities (Hum) 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- MATH 146 Applied Calculus I 3
- SOC 110 Introduction to Sociology (U) 3
- ANTH 171 Introduction to Cultural Anthropology (G) 3

**Credits** 18

#### Sophomore Year

##### Fall
- ECON 201 Principles of Microeconomics 3
- ACCT 200 Elements of Accounting I 3
- ISBC 117 Personal Productivity with Information Technology 1
- Essential Studies: Lab Science 4
- Essentials Studies: Fine Arts and Humanities (U or G) 3
- Elective 3

**Credits** 17

##### Spring
- ECON 202 Principles of Macroeconomics 3
- ACCT 201 Elements of Accounting II 3
- ECON 210 Introduction to Business and Economic Statistics 3
- MGMT 300 Principles of Management 3
- Elective 3

**Credits** 15

#### Junior Year

##### Fall
- ISBC 217 Fundamentals of Computer Information Systems 3
- MRKT 305 Marketing Foundations 3
- ECON 303 Money and Banking 3
- MGMT 301 Operations Management 3
- Elective 3

**Credits** 18

##### Spring
- ACCT 315 Business Law I 3
- MGMT 310 Organizational Behavior 3
- FIN 310 Principles of Financial Management 3
- Management Elective 3
Managerial Finance & Accounting

B.B.A. with Major in Managerial Finance & Accounting

Freshman Year

Fall
ENGL 110 College Composition I 3
MATH 103 College Algebra 3
POLS 115 American Government I 3
Essential Studies: Fine Arts 3
PSYC 111 or SOCI 110 or ANTH 171
Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology 3
Credits 15

Spring
Essential Studies: FA or Humanities 3
Essential Studies: Global Diversity 3
ENGL 130 Composition II: Writing for Public Audiences 3
COMM 110 Fundamentals of Public Speaking 3
MATH 146 Applied Calculus I 3
Credits 15

Total Credits 127

Sophomore Year

Fall
Open Elective 3
Essential Studies: Humanities 3
Essential Studies: Lab Science 4
ACCT 200 Elements of Accounting I 3
ECON 201 Principles of Microeconomics 3
ISBC 117 Personal Productivity with Information Technology 1
Credits 17

Spring
Essential Studies/Special Emphasis: United States Diversity 3
ACCT 201 Elements of Accounting II 3
ACCT 218 Advanced Spreadsheet Applications 3
ECON 202 Principles of Macroeconomics 3
ECON 210 Introduction to Business and Economic Statistics 3
ISBC 317 3
Credits 18

Junior Year

Fall
Open Elective 1 2
ACCT 301 Intermediate Accounting I 3
ACCT 320 Cost Accounting 3
ACCT 315 Business Law I 3
MGMT 300 Principles of Management 3
FIN 310 Principles of Financial Management 3
Credits 17

Spring
ACCT 302 Intermediate Accounting II 3
ACCT 309 Accounting Information Systems 3
FIN 340 Intermediate Financial Management 3
MRKT 305 Marketing Foundations 3
MGMT 301 Operations Management 3
Credits 15

Senior Year

Fall
Accounting/Finance Elective 2 3
ECON 303 Money and Banking 3
FIN 350 Financial Statement Analysis 3
FIN 360 Capital Market Financing and Investment Strategies 3
Essential Studies/Special Emphasis: Advanced Communication 3
Credits 15

Spring
Open Elective 3
FIN 475 Cases in Managerial Finance 3
MGMT 475 Strategic Management 3
Accounting/Finance Electives 3
Credits 15

Total Credits 127

1 = You must complete enough open electives to bring total credit hours up to 127.
2 = At least 3 electives (9 credit hours) from 300/400 level Finance or Accounting courses.

Managerial Finance & Accounting

B.B.A. with Major in Managerial Finance & Accounting

Freshman Year

Fall
Credits
ENGL 110 College Composition I 3
MATH 103 College Algebra 3
POLS 115 American Government I 3
Essential Studies: Fine Arts 3
PSYC 111 or SOCI 110 or ANTH 171
Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology 3
Credits 15

Spring
Essential Studies: FA or Humanities 3
Essential Studies: Global Diversity 3
ENGL 130 Composition II: Writing for Public Audiences 3
COMM 110 Fundamentals of Public Speaking 3
MATH 146 Applied Calculus I 3
Credits 15

Total Credits 127

Sophomore Year

Fall
Open Elective 3
Essential Studies: Humanities 3
Essential Studies: Lab Science 4
ACCT 200 Elements of Accounting I 3
ECON 201 Principles of Microeconomics 3
ISBC 117 Personal Productivity with Information Technology 1
Credits 17

Spring
Essential Studies/Special Emphasis: United States Diversity 3
ACCT 201 Elements of Accounting II 3
ACCT 218 Advanced Spreadsheet Applications 3
ECON 202 Principles of Macroeconomics 3
ECON 210 Introduction to Business and Economic Statistics 3
ISBC 317 3
Credits 18

Junior Year

Fall
Open Elective 1 2
ACCT 301 Intermediate Accounting I 3
ACCT 320 Cost Accounting 3
ACCT 315 Business Law I 3
MGMT 300 Principles of Management 3
FIN 310 Principles of Financial Management 3
Credits 17

Spring
ACCT 302 Intermediate Accounting II 3
ACCT 309 Accounting Information Systems 3
FIN 340 Intermediate Financial Management 3
MRKT 305 Marketing Foundations 3
MGMT 301 Operations Management 3
Credits 15

Senior Year

Fall
Accounting/Finance Elective 2 3
ECON 303 Money and Banking 3
FIN 350 Financial Statement Analysis 3
FIN 360 Capital Market Financing and Investment Strategies 3
Essential Studies/Special Emphasis: Advanced Communication 3
Credits 15

Spring
Open Elective 3
FIN 475 Cases in Managerial Finance 3
MGMT 475 Strategic Management 3
Accounting/Finance Electives 3
Credits 15

Total Credits 127

1 = You must complete enough open electives to bring total credit hours up to 127.
2 = At least 3 electives (9 credit hours) from 300/400 level Finance or Accounting courses.

Marketing

B.B.A. with Major in Marketing (Option A) (p. 316)

B.B.A. with Major in Marketing (Option B)

B.B.A. with Major in Marketing (Option A)

Freshman Year

First Semester
Credits
ENGL 110 College Composition I 3
MATH 103 College Algebra 3

Credits 17
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>ENGL 110</td>
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<td>3</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<td>or SOC 110</td>
<td>or Introduction to Sociology</td>
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<tr>
<td>or ANTH 171</td>
<td>or Introduction to Cultural Anthropology</td>
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**Credits:** 15

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**Second Semester**

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<tr>
<td>COMM 110</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<tr>
<td>Essential Studies: Humanities</td>
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**Credits:** 15

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**Total Credits:** 125

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1. Marketing 310 and 325 and 330 all MUST be taken SOMEWHERE in the junior year. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [hppt://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

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**B.B.A. with Major in Marketing (Option B)**

### Freshman Year

#### First Semester

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<tr>
<th>Course Code</th>
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<tr>
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<td>POLS 115</td>
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<tr>
<td>PSYC 111</td>
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<td>or SOC 110</td>
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<td>or ANTH 171</td>
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**Credits:** 15

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#### Second Semester

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<tr>
<td>ENGL 130</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
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<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
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<tr>
<td>Essential Studies: Humanities</td>
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<td>Essential Studies: US Diversity</td>
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**Credits:** 16

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### Sophomore Year

#### First Semester

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts or Humanities</td>
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<td>Essential Studies: Lab Science</td>
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**Credits:** 19

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#### Second Semester

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<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
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<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
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<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
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<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
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<td>Electives</td>
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**Credits:** 16

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### Junior Year

#### First Semester

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<td>Consumer Behavior</td>
<td>3</td>
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<td>or MRKT 325</td>
<td>or International Marketing</td>
<td>3</td>
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<tr>
<td>or MRKT 330</td>
<td>or Marketing Research</td>
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<tr>
<td>MRKT 325</td>
<td>International Marketing</td>
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<td>or MRKT 310</td>
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<td>or MRKT 330</td>
<td>or Marketing Research</td>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
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<td>MGMT 300</td>
<td>Principles of Management</td>
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<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
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**Credits:** 15

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#### Second Semester

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<td>International Marketing</td>
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<td>MGMT 301</td>
<td>Operations Management</td>
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<td>ACCT 315</td>
<td>Business Law I</td>
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**Credits:** 15

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### Senior Year

#### First Semester

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<td>MRKT 305</td>
<td>Marketing Foundations</td>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
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<tr>
<td>MGMT 300</td>
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**Credits:** 15

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#### Second Semester

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<tr>
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<tr>
<td>MRKT 310</td>
<td>Consumer Behavior</td>
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<td>MRKT 325</td>
<td>International Marketing</td>
<td>3</td>
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<tr>
<td>MRKT 330</td>
<td>Marketing Research</td>
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<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
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</table>

**Credits:** 15
**Operations & Supply Chain Management**

**B.B.A. with Major in Operations and Supply Chain Management**

**Freshman Year**

**Fall**
- ENGL 110 College Composition I 3
- POLS 115 American Government I 3
- PSYC 111 Introduction to Psychology 3
- MATH 103 College Algebra 3
- Essential Studies: FA or UA 3

**Credits**: 16

**Spring**
- COMM 110 Fundamentals of Public Speaking 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- MATH 146 Applied Calculus I 3
- SOC 110 Introduction to Sociology (U) 3
- ANTH 171 Introduction to Cultural Anthropology (G) 3
- Essential Studies: FA (Hum) 3
- Elective 3

**Credits**: 16

**Sophomore Year**

**Fall**
- ECON 201 Principles of Microeconomics 3
- ACCT 200 Elements of Accounting I 3
- Lab Science 4
- Essential Studies: FA (U or G) 3
- ISBC 117 Personal Productivity with Information Technology 1

**Credits**: 17

**Spring**
- ACCT 201 Elements of Accounting II 3
- ECON 202 Principles of Macroeconomics 3
- ECON 210 Introduction to Business and Economic Statistics 3
- MGMT 300 Principles of Management 3

**Credits**: 15

**Junior Year**

**Fall**
- ISBC 217 Fundamentals of Computer Information Systems 3
- MRKT 305 Marketing Foundations 3
- ECON 303 Money and Banking 3
- MGMT 301 Operations Management 3
- FIN 310 Principles of Financial Management 3

**Credits**: 15

**Spring**
- ACCT 315 Business Law I 3
- MGMT 309 Quantitative Methods for Managers 3
- MGMT 431 Supply Chain Management 3
- Operations/Supply Chain Elective (ISBC 320-A) 3
- Elective 3

**Credits**: 15

**Senior Year**

**Fall**
- MGMT 310 Organizational Behavior 3
- MGMT 432 Supplier Relationship Management 3
- MGMT 433 Logistics in the Supply Chain 3
- Operations/Supply Chain Elective 3
- Elective 3

**Credits**: 15

**Spring**
- MGMT 439 Operations/Supply Chain Elective 3
- MGMT 439 Operations/Supply Chain Elective 3
- Elective 3
- Elective 3

**Credits**: 15

**Total Credits**: 128

**Political Science**

**B.A. with Major in Political Science**

**Freshman Year**

**First Semester**
- ENGL 110 College Composition I 3
- MATH 103 College Algebra 3
- POLS 115 American Government I 3
- Essential Studies: Global Diversity Recommended: Anth 171 or Geog 161 3
- Language 101 or 102 Students may select any foreign language offered 4

**Credits**: 16

**Second Semester**
- COMM 110 Fundamentals of Public Speaking 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- POLS 116 State and Local Government 3
- Essential Studies: Fine Arts 3
- Language 102 Students should continue with language pursued in Freshman Year - First Term 4

**Credits**: 16

**Sophomore Year**

**First Semester**
- POLS 225 Comparative Politics 3
- POLS 250 or Introduction to Public Administration 3
- ECON 201 Principles of Microeconomics 3

**Credits**: 16

**Second Semester**
- POLS 225 Comparative Politics 3
- POLS 250 or Introduction to Public Administration 3
- ECON 201 Principles of Microeconomics 3

**Credits**: 16

-- Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
ECON 210 or PSYC 241 or SOC 326: Introduction to Business and Economic Statistics or Introduction to Statistics or Sociological Statistics 3

Essential Studies: Humanities Recommended: PHIL 110 3

Open Electives 3

Credits 15

Second Semester

POLS 220: International Politics Students may choose POLS 250 in Junior Year - Fall in which case, this course can be used as an elective or another elective may be selected in its place 3

ECN 202: Principles of Macroeconomics 3

Open Electives 6

Credits 16

Junior Year

First Semester

POLS 300: Introduction Research Methods 3

POLS 310: Introduction to Political Thought 3

POLS Elective: Student may choose POLS 405 in place of POLS 432 in Junior Year-Spring 3

Open Electives Recommended: 300 or above; if student did not select POLS 220 in Sophomore Year-Spring, then POLS 250 should be selected for 3 of these 6 hours 6

Credits 15

Second Semester

POLS 318: American Political Thought Recommended to fulfill a POLS elective and Essential Studies &quot;U&quot; but a student may select any Essential Studies &quot;U&quot; course 3

POLS 432: Public Policy Making Process. If student selected POLS 432 in Junior Year-Fall, this course may be substituted for any POLS elective 3

Open Electives If students does not choose POLS 318, 3 of these open elective hours should be POLS to meet elective requirement 10

Credits 16

Senior Year

First Semester

Open Electives Recommended: 300 or above 13

POLS Elective Recommended: 300 or above 3

Credits 16

Second Semester

POLS 495: Senior Colloquium in Political Science and Public Administration Recommended: 300 or above 3

POLS Elective Recommended: 300 or above 3

Open Electives Recommended: 300 or above 9

Credits 15

Total Credits 125

The Department of Political Science and Public Administration is housed within the College of Business and Public Administration and the B.A. in Political Science degree is conferred by the College of Arts and Sciences. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Public Administration

B.S. with Major in Public Administration

Freshman Year

First Semester

ENGL 110: College Composition I 3

MATH 103: College Algebra 3

POLS 115: American Government I 3

Fine Arts Essential Studies 3

Science with Lab Essential Studies 4

Credits 16

Second Semester

POLS 115: American Government I 3

Global Diversity Essential Studies 3

ENGL 130: Composition II: Writing for Public Audiences 3

Credits 15

Sophomore Year

First Semester

POLS 250: Introduction to Public Administration 3

ECN 201: Principles of Macroeconomics 3

ACCT 200: Elements of Accounting I 3

ISBC 117: Personal Productivity with Information Technology 3

US Diversity Essential Studies 3

Credits 16

Second Semester

POLS 329: Presidential Institutions and Management Student may choose Pols 329 in Junior Year - Spring and add another open elective Junior Year - Fall 3

MGMT 300: Principles of Management Recommended: 300 or above 3

Open Electives Recommended: 300 or above 7

Credits 16

Credits 16

Second Semester

ECON 324: Public Finance 3

POLS 328: Legislative Processes Students who took Pols 329 Junior Year - Fall can replace this course with an open elective 3

POLS 432: Public Policy Making Process Recommended: 300 or above 3

Open Elective Recommended: 300 or above 3

Credits 16

Senior Year

First Semester

MGMT 310 or SOC 431: Organizational Behavior Recommended: 300 or above 3

MGMT 400: Organizational Theory and Analysis Recommended: 300 or above 3

Open Electives Recommended: 300 or above 9

Credits 15

Total Credits 125

Second Semester

POLS 404: Urban Politics and Administration 3

POLS 437: Administrative Processes 3

POLS 495: Senior Colloquium in Political Science and Public Administration Recommended: 300 or above 3

Open Electives Recommended: 300 or above 7

Credits 16

Total Credits 125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

College of Education & Human Development

B.S. ED. with a Major in Early Childhood Education (p. 320)
### Early Childhood Education

**B.S. ED. with a Major in Early Childhood Education**

**Freshman Year**

**First Semester**
- **ENGL 110** College Composition I 3
- **T&L 252** Child Development 3
- **FA 150** Introduction to the Fine Arts 3
  or **THEA 110** Introduction to Theatre Arts 3
- **Essential Studies: Social Science** 1 3
- **Essential Studies: Arts & Humanities (Fine Arts)** 3
- **Essential Studies: Math/Sci/Tech** 2 3-4

**Credits** 18-19

**Second Semester**
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **Essential Studies: Math/Sci/Tech** 2 3-4
- **T&L 310** Introduction to Early Childhood Education 3
- **T&L 315** Education of Exceptional Students 3
- **COMM 110** Fundamentals of Public Speaking 3
- **Essential Studies: Arts and Humanities (Humanities)** 3

**Credits** 18-19

**Sophomore Year**

**First Semester**
- **T&L 250** Introduction to Education 3
- **T&L 315** Education of Exceptional Students 3
- **Science** 1 2-4
- **T&L 338** Home, School and Community Relations 3
- **T&L 313** Language Development and Emerging Literacy 3
- **Essential Studies: Social Science** 1 3
- **Essential Studies: Math/Sci/Tech** 2 3-4

**Credits** 15-16

**Second Semester**
- **T&L 320** Infant and Toddler 3
- **T&L 336** Social and Emotional Development and Guidance of Children 3
- **T&L 328** Survey of Children’s Literature 3
- **T&L 335** Understanding Readers and Writers 3
- **T&L 322** Administration and Leadership in Early Childhood Education 3
- **T&L 453** Methods and Materials: Kindergarten 2

**Credits** 17

**Junior Year**

**First Semester**
- **T&L 311** Observing and Assessing Children 3
- **T&L 411** Primary Reading and Language Arts 2
- **T&L 433** Multicultural Education 3
- **T&L 443** Mathematics for Primary Grades 2
- **T&L 333** Methods and Materials: Pre-Kindergarten 3
- **T&L 486** Field Experience 1
- **T&L 339** Technology for Teachers 2

**Credits** 16

**Second Semester**
- **T&L 410** Teaching Reading in the Elementary School Classroom (TEAM) 3
- **T&L 430** Social Studies in the Elementary School (Team) 3
- **T&L 440** Mathematics in Elementary School (Team) 3
- **T&L 470** Science in the Elementary School (TEAM) 3
- **T&L 486** Field Experience 2

**Credits** 14

**Senior Year**

**First Semester**
- **T&L 456** Early Childhood Ed Seminar 1
- **T&L 487** Student Teaching 9

**Credits** 10

**Second Semester**
- **T&L 487** Student Teaching 13
- **T&L 488** Senior Seminar 1
- **T&L 489** Senior Capstone: Responsive Teaching 3

**Credits** 17

**Total Credits** 125-128

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1 = Social science courses must be from a minimum of two departments. 2 = Math/Science/Technology Elective: 9 credits: minimum of 2 departments, must include a 4 hour science course with lab. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

### Elementary Education

**B.S. ED. with a Major in Elementary Education**

**Freshman Year**

**First Semester**
- **ENGL 110** College Composition I 3
- **GEOG 151** or **GEOG 161** Human Geography or World Regional Geography 3
- **Science** 1 2-4
- **FA 150** Introduction to the Fine Arts 3
  or **THEA 110** Introduction to Theatre Arts 3
- **HIST 101** Western Civilization I 3
  or **HIST 102** or Western Civilization II 3
  or **HIST 103** or United States to 1877 3
  or **HIST 104** or United States since 1877 3
  or **HIST 105** or World Civilizations I 3
  or **HIST 106** or World Civilizations II 3
  or **HIST 220** or History of North Dakota 3

**Credits** 14-16

**Second Semester**
- **T&L 252** Child Development 3
  or **PSYC 250** or Developmental Psychology 3
- **COMM 110** Fundamentals of Public Speaking 3
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **HUM 101** or **HUM 102** Humanities 3
- **MATH 103** College Algebra 3
- **Social Science** 2 3

**Credits** 18

**Sophomore Year**

**First Semester**
- **T&L 250** Introduction to Education 3
- **T&L 315** Education of Exceptional Students 3
- **Science** 1 2-4
- **Minor or Specialty Area** 4 6

**Credits** 14-16
## University of North Dakota

### Second Semester

- **T&L 328** Survey of Children's Literature or T&L 329 Young Adult Literature 3
- **T&L 335** Understanding Readers and Writers 3
- **T&L 339** Technology for Teachers 2
- **MATH 277** Mathematics for Elementary School Teachers 3
- **MUSC 442** Music for Elementary School Teachers or MUSC 443 Music Methods and Materials for Elementary School Teachers 3
- Minor or Specialty Area 4 3

**Credits**: 17

### Junior Year

#### First Semester

- **T&L 432** Learning Environments 3
- Minor or Specialty Area 5 6
- Science 1 2-4
- **ART 460** Methods, Materials and Philosophy: Art in the Elementary Classroom 3
- **KIN 305** Health/Physical Education for Early Childhood and Elementary Education Teachers 3

**Credits**: 17-19

#### Second Semester

- **T&L 417** Writing & Language Arts Methods 2
- **T&L 433** Multicultural Education 3
- Science 1 3-4
- Minor or Specialty Area 4 6

**Credits**: 14-15

### Senior Year

#### First Semester

- **T&L 410** Teaching Reading in the Elementary School Classroom (TEAM) 3
- **T&L 430** Social Studies in the Elementary School (Team) 3
- **T&L 440** Mathematics in Elementary School (Team) 3
- **T&L 470** Science in the Elementary School (TEAM) 3
- **T&L 486** Field Experience 2

**Credits**: 14

#### Second Semester

- **T&L 487** Student Teaching 13
- **T&L 488** Senior Seminar 1
- **T&L 489** Senior Capstone: Responsive Teaching 3

**Credits**: 17

**Total Credits**: 125-132

---

### B.S. in Kinesiology: Option A-Teacher Education/Certification

#### Freshman Year

**Fall**
- **CHEM 115** Introductory Chemistry 3
- **CHEM 115L** Introductory Chemistry Laboratory 1
- **ENGL 110** College Composition I 3
- **SOC 110** Introduction to Sociology 3
- **PSYC 111** Introduction to Psychology 3
- Essential Studies 3

**Credits**: 16

**Spring**
- **NUTR 240** 3
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **COMM 110** Fundamentals of Public Speaking 3
- **KIN 326** Fundamentals of Physical Conditioning 3
- **T&L 252** Child Development 3
- Essential Studies 3

**Credits**: 18

### Sophomore Year

#### Fall
- **T&L 250** Introduction to Education 3
- **ANAT 204** Anatomy for Paramedical Personnel 3
- **ANAT 204L** Anatomy for Paramedical Personnel Laboratory 2
- **KIN 401** Sport Sociology 3
- Essential Studies 3

**Credits**: 14

#### Spring
- **KIN 207** Prevention and Care of Physical Activity Injuries 3
- **PPT 301** Human Physiology 4
- **KIN 224** Aquatics: Movement Performance and Analysis (MP&A) 1
- **KIN 231** Individual Sports/Activities: Movement Performance and Analysis (MP&A) 2
- **KIN 440** Sport Psychology 3
- **KIN 403** School Health Education 2
- Essential Studies 3

**Credits**: 18

### Junior Year

#### Fall
- **KIN 390** Introduction to Teaching in Physical Education and Coaching 2
- **KIN 390L** Introduction to Teaching in Physical Education and Coaching Laboratory 2
- **KIN 402** Exercise Physiology 3
- **KIN 402L** Exercise Physiology Laboratory 1
- **KIN 327** Fitness for Life 3
- **KIN 236** Team Sports: Movement Performance and Analysis (MP&A) 3
- **KIN 290** Physical Education Activities for the Elementary Grades 3

**Application into Teacher education**

**Credits**: 17

#### Spring
- **KIN 404** Adapted Physical Activity 3
- **KIN 276** Motor Learning 2
- **KIN 276L** Motor Learning Lab 1
- **KIN 400** Methods and Materials for Teaching Physical Education Elementary School 2
- **KIN 400L** Methods and Materials for Teaching Physical Education in the Elementary School -Laboratory 2
- **KIN 355** Applied Motor Development 3

---

### Kinesiology

- **B.S. in Kinesiology: Option A-Teacher Education/Certification** (p. 321)
- **B.S. in Kinesiology: Option B-Related Areas or Option D-Allied Health** (p. 322)
- **B.S. in Kinesiology: Option C** (p. 322)
- **B.S. in Public Health Education (B.S.P.H.E.)** (p. 323)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 420</td>
<td>Curriculum Development for Physical and Health Education</td>
<td>3</td>
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### Senior Year

#### Fall

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<thead>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 332</td>
<td>Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>KIN 332L</td>
<td>Biomechanics Laboratory</td>
<td>1</td>
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<tr>
<td>KIN 410</td>
<td>Methods and Materials for Teaching Physical and Health Education in the Secondary School</td>
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<tr>
<td>KIN 410L</td>
<td>Methods and Materials for Teaching Physical &amp; Health Education in the Secondary School-Laboratory</td>
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<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
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<td>T&amp;L 433</td>
<td>Multicultural Education</td>
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<tr>
<td>KIN 227</td>
<td>Dance: Movement Performance and Analysis (MP&amp;A)</td>
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<tr>
<td>KIN 233</td>
<td>Racquet Sports: Movement Performance and Analysis (MP&amp;A)</td>
<td>1</td>
</tr>
<tr>
<td>KIN 232</td>
<td>Outdoor Pursuits: Movement Performance and Analysis (MP&amp;A)</td>
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#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 491</td>
<td>Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>2</td>
</tr>
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</table>

#### Credits

| Total Credits | 16                        |

### B.S. in Kinesiology: Option B-Related Areas or Option D-Allied Health

#### Freshman Year

#### Fall

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115L</td>
<td>Introductory Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td>Essential Studies</td>
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#### Spring

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
</tr>
</tbody>
</table>

| Essential Studies |                                                 | 3       |

#### Credits

| Total Credits | 16                        |

### Sophomore Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 204L</td>
<td>Anatomy for Paramedical Personnel Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>KIN 401</td>
<td>Sport Sociology</td>
<td>3</td>
</tr>
</tbody>
</table>

| Related Area/Pre-Allied Health Requirement |                                               | 3       |

| Essential Studies |                                               | 3       |

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 224</td>
<td>Aquatics: Movement Performance and Analysis (MP&amp;A)</td>
<td>1</td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
<td>3</td>
</tr>
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</table>

### Junior Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>KIN 332</td>
<td>Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>KIN 332L</td>
<td>Biomechanics Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

| KIN 231    | Individual Sports/Activities: Movement Performance and Analysis (MP&A) | 1       |
| KIN 440    | Sport Psychology                                          | 3       |

| Complete Criminal Background Check |                                                   | 3       |
| Essential Studies |                                               | 3       |

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 402</td>
<td>Exercise Physiology</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402L</td>
<td>Exercise Physiology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>KIN 236</td>
<td>Team Sports: Movement Performance and Analysis (MP&amp;A)</td>
<td>1</td>
</tr>
</tbody>
</table>

| Related Area/Pre-Allied Health Requirement |                                               | 11      |

### Senior Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 402</td>
<td>Exercise Physiology</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402L</td>
<td>Exercise Physiology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>KIN 236</td>
<td>Team Sports: Movement Performance and Analysis (MP&amp;A)</td>
<td>1</td>
</tr>
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</table>

| Related Area/Pre-Allied Health Requirement |                                               | 11      |

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 491</td>
<td>Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
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</table>

#### Credits

| Total Credits | 16                        |

### B.S. in Kinesiology: Option C

#### Freshman Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td></td>
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</table>

| MOD 100    | Introduction to Occupation                                 | 3       |
| Essential Studies |                                                 | 3       |

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
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</tbody>
</table>

| Essential Studies |                                               | 3       |

#### Credits

| Total Credits | 16                        |

### Sophomore Year

#### Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
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<tr>
<td>ANAT 204L</td>
<td>Anatomy for Paramedical Personnel Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>KIN 401</td>
<td>Sport Sociology</td>
<td>3</td>
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</table>

| Related Area/Pre-Allied Health Requirement |                                               | 3       |

| Essential Studies |                                               | 3       |

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>KIN 224</td>
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<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
<td>3</td>
</tr>
</tbody>
</table>

| Essential Studies |                                               | 3       |

#### Credits

| Total Credits | 17                        |

### Notes

- Pre-Allied Health Students should also meet with a Pre-Allied health program adviser for selection of Pre-Allied health courses. **Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
B.S. in Public Health Education (B.S.P.H.E.)

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
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<tr>
<td>PHE 101 Introduction to Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PHE 103 Introduction to Global Health</td>
<td>3</td>
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<tr>
<td>Total Credits</td>
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Spring

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PHE 102 Epidemiology in Public Health</td>
<td>3</td>
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<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
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<tr>
<td>N&amp;D 240 Fundamentals of Nutrition</td>
<td>3</td>
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Sophomore Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>KIN 110 First Aid and CPR</td>
<td>1</td>
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<tr>
<td>ANAT 204 Anatomy for Paramedical Personnel</td>
<td>3</td>
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<tr>
<td>ANAT 204L Anatomy for Paramedical Personnel Laboratory</td>
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<td>Essential Studies</td>
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<td>Related Minor Courses</td>
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<tr>
<td>Total Credits</td>
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Spring

<table>
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<tr>
<th>Course</th>
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<tr>
<td>PPT 301 Human Physiology</td>
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<td>Related Minor Courses</td>
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<td>Total Credits</td>
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Junior Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 402 Exercise Physiology</td>
<td>3</td>
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<tr>
<td>KIN 402L Exercise Physiology Laboratory</td>
<td>1</td>
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<tr>
<td>KIN 376 Professional Skills in Personal Training</td>
<td>3</td>
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<td>KIN 327 Fitness for Life</td>
<td>3</td>
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<td>KIN 236 Team Sports: Movement Performance and Analysis (MP&amp;A)</td>
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Spring

<table>
<thead>
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<tbody>
<tr>
<td>KIN 404 Adapted Physical Activity</td>
<td>3</td>
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<tr>
<td>KIN 276 Motor Learning</td>
<td>2</td>
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<tr>
<td>KIN 276L Motor Learning Lab</td>
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<tr>
<td>KIN 446 Exercise Testing and Prescription</td>
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Senior Year

Summer

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<tbody>
<tr>
<td>KIN 497 Internship in KIN</td>
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Fall

<table>
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<tbody>
<tr>
<td>KIN 332 Biomechanics</td>
<td>3</td>
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<tr>
<td>KIN 332L Biomechanics Laboratory</td>
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<tr>
<td>KIN 401 Sport Sociology</td>
<td>3</td>
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Spring

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<tr>
<td>KIN 434 Strength Training: Coaching Methods</td>
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<tr>
<td>KIN 355 Applied Motor Development</td>
<td>3</td>
</tr>
<tr>
<td>KIN 375 Fundamentals of Group Exercise Instruction</td>
<td>3</td>
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<tr>
<td>Essential Studies: Senior Capstone</td>
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<td>Electives</td>
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<td>Total Credits</td>
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</table>

Total Credits 119

**^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

B.S. ED. with a Major in Middle Level Education

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
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<tr>
<td>Social Science 1</td>
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<tr>
<td>Total Credits</td>
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</table>

Middle Level Education

**^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
Rehabilitation & Human Services

B.S. in Rehabilitation and Human Services

Freshman Year
First Semester
ENGL 110 College Composition I 3
PSYC 111 Introduction to Psychology 3
Biol 111 Concepts of Biology (Or any ES science course) 3
Biol 111L Concepts of Biology Laboratory (Or any ES lab course) 1
Musc 100 Introduction to the Understanding of Music (Or any ES Fine Arts course) 3
FA 150 Introduction to the Fine Arts (Or any 3 credit elective) 3

Second Semester
ENGL 130 Composition II: Writing for Public Audiences 3
Soc 110 Introduction to Sociology 3
Math 103 College Algebra 3
Hist 101 Western Civilization I (Or any ES Humanities course) 3
Is 121 Introduction to American Indian Studies (Or any 3 credit elective) 3

Sophomore Year
First Semester
Rhs 200 Helping Skills in Community Services 3
Comm 110 Fundamentals of Public Speaking 3
Psyc 250 Developmental Psychology 4
Nutr 240 3
Engl 225 Introduction to Film (Or any 3 credit elective) 3

Second Semester
Rhs 250 Contemporary Issues in Rehabilitation 3
Coun 250 Dialogue on U.S. Diversity 3
Psyc 270 Abnormal Psychology 3
Hist 102 Western Civilization II (Or any approved ES Arts & Humanities course) 3
Phil 101 Introduction to Philosophy (Or any 3 credit elective) 3

Junior Year
First Semester
Rhs 350 Overview of Disabilities 3
Rhs 455 Rehabilitation Process 3
Soc 361 Social Psychology 3
Rts 201 Recreation and Society 3
Soc 355 Drugs and Society (Or any 3 credit emphasis course) 3

Second Semester
Rhs 450 Vocational Assessment and Job Acquisition 3
Psyc 360 Introduction to Personality 3
Rhs 499 Special Topics 1-3
T&L 319 Inclusive Strategies (Or any 3 credit emphasis course) 3

Summer
Rhs 493 Senior Capstone Seminar 3
Rhs 497 Internship in Rehabilitation 9

These courses may also be taken in the summer of the Senior Year

Total Credits: 125-128

1 = Social Science - a total of 9 credits from a minimum of two departments.
2 = Math/Science/Technology - a total of 9 credits from a minimum of two departments with at least one 4 hour science course with a lab. 3 = Two Areas of Concentration: 24 credits per content area. Recommended concentration areas: English, health, industrial technology, languages, math, science, social studies, art.

^AA Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
Senior Year
First Semester
PSYC 303 Research Methods in Psychology (Or any 3 credit research methods course) 4
SWK 315 Substance Use and Abuse (Or any 3 credit emphasis course) 2
PPT 315 Human Pharmacology (Or any course for minor) 3
ANTH 171 Introduction to Cultural Anthropology (Or any ES Global Diversity course) 3
IS 385 Sustainable Communities 3

Second Semester
SOC 326 Sociological Statistics (Or any 3 credit statistics course) 3
SWK 313 Orientation to Gerontology (Or any 3 credit emphasis course) 3
SOC 352 Aging and Society (Or any 3 credit elective) 3
CSD 101 American Sign Language I (Or any 3 credit elective) 2

Credits 15

Second Semester
Sociological Statistics (Or any 3 credit statistics course) 3
Orientation to Gerontology (Or any 3 credit emphasis course) 3
Aging and Society (Or any 3 credit elective) 3
American Sign Language I (Or any 3 credit elective) 2

Credits 11

Total Credits 15-17

ES = Essential Studies. *^* Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Science Education
B.S. ED. with a Major in Science Education

Freshman Year
First Semester
ENGL 110 College Composition I 3
Social Science 1 3
Arts & Humanities (Fine Arts) 3
Science Course Area 1 3
Science Course Area 2 3

Credits 15-17

Second Semester
ENGL 130 Composition II: Writing for Public Audiences 3
COMM 110 Fundamentals of Public Speaking 3
Social Science 1 3
Arts & Humanities (HUM) 3
Science Course Area 1 3
Science Course Area 2 3

Credits 18-20

Sophomore Year
First Semester
T&L 250 Introduction to Education 3
T&L 319 Inclusive Strategies 3
Social Science 1 3
Arts & Humanities (FA or HUM) 3
Science Course Area 1 3
Science Course Area 2 3

Credits 18-20

Second Semester
T&L 339 Technology for Teachers 2
MATH 165 Calculus I 4
Science Course Area 1 3
Science Course Area 2 3

Credits 14

Junior Year
First Semester
T&L 345 Curriculum Development and Instruction 3
T&L 350 Development and Education of the Adolescent 3
Science Course Area 1 4
Science Course Area 3 4

Credits 14

Second Semester
T&L 432 Learning Environments 3
MATH 166 Calculus II 4
MATH 321 Applied Statistical Methods or PSYC 241 or Introduction to Statistics or ECON 210 or Introduction to Business and Economic Statistics

Science Course Area 1 4
Science Course Area 3 4

Credits 16-18

Senior Year
First Semester
T&L 400 Methods and Materials 3
T&L 401 School Safety Science 1
T&L 486 Field Experience 2
T&L 433 Multicultural Education 3
Science Course Area 4 3

Credits 13

Second Semester
T&L 487 Student Teaching 13
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3

Credits 17

Total Credits 125-133

1 = Social Science - 9 credits, minimum of two departments. 2 = Minimum of 24 credits in ONE of the following areas: biology, chemistry, physics or earth science. 3 = Minimum of 12 credits in science area not chosen in Area 1: biology, chemistry, physics or earth science. 4 = Minimum of 12 credits in science area not chosen as Area 1 or 2: biology, chemistry, physics or earth science. 5 = Minimum of 4 credits in science area not chosen above as Areas 1, 2 or 3: biology, chemistry, physics or earth science. *^* Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Social Studies Education
B.S. ED. with a Major in Social Studies Education

Freshman Year
First Semester
ENGL 110 College Composition I 3
Math/Science/Technology 1 3
GEOG 161 World Regional Geography 3
HIST 103 United States to 1877 3
POLS 115 American Government I 3

Credits 15-16

Second Semester
COMM 110 Fundamentals of Public Speaking 3
Elective 2 3
ENGL 130 Composition II: Writing for Public Audiences 3
FA 150 Introduction to the Fine Arts (Or other Fine Arts Elective) 3
MATH 103 College Algebra 3
HIST 104 United States since 1877 3

Credits 18

1 = Social Science - 9 credits, minimum of two departments. 2 = Minimum of 24 credits in ONE of the following areas: biology, chemistry, physics or earth science. 3 = Minimum of 12 credits in science area not chosen in Area 1: biology, chemistry, physics or earth science. 4 = Minimum of 12 credits in science area not chosen as Area 1 or 2: biology, chemistry, physics or earth science. 5 = Minimum of 4 credits in science area not chosen above as Areas 1, 2 or 3: biology, chemistry, physics or earth science. *^* Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
Sophomore Year
First Semester
HIST 101 Western Civilization I 3
ECON 201 Principles of Microeconomics 3
T&L 250 Introduction to Education 3
T&L 319 Inclusive Strategies 3
Math/Science/Technology 1 3-4
Or
ECON 210 Introduction to Business and Economic Statistics 3
Electives (Social Science) 2
Credits 20-21

Second Semester
ECON 202 Principles of Macroeconomics 3
HIST 102 Western Civilization II 3
POL 116 State and Local Government 3
POL 220 International Politics 3
Electives 2 3
Credits 15

Junior Year
First Semester
T&L 339 Technology for Teachers 2
T&L 350 Development and Education of the Adolescent 3
ECON 303 Money and Banking 3
HIST 220 History of North Dakota 3
POL 305 American Constitution-Governmental Powers 3
or POLS 306 American Constitution-Civil Liberties 3
or POLS 308 Intergovernmental Relations 3
or POLS 310 or Introduction to Political Thought 3
or POLS 318 American Political Thought 3
Credits 14

Second Semester
T&L 345 Curriculum Development and Instruction 3
T&L 433 Multicultural Education 3
GEOG 262 Geography of North America I 3
GEOG 419 Methods and Materials of Teaching Middle and Secondary School in Geographic Education 3
Electives in History (300 or above) 3
Credits 15

Senior Year
First Semester
T&L 400 Methods and Materials 3
T&L 486 Field Experience 2
T&L 432 Learning Environments 3
ECON 210 or ECON 330 Introduction to Business and Economic Statistics 3
or Business and Economic History 3
GEOG 271 The Power of Maps 3
or GEOG 377 or Quantitative Applications in Geography 3
or GEOG 471 or Cartography and Visualization 3
or GEOG 474 or Introduction to Geographic Information Systems (GIS) 3
Credits 14

Second Semester
T&L 487 Student Teaching 13
T&L 488 Senior Seminar 1
T&L 489 Senior Capstone: Responsive Teaching 3
Credits 17
Total Credits 128-130

1 = 9 credits: minimum 2 departments, must include a 4-hour science course with lab. 2 = 6 credits in one of the following areas Psychology, Sociology, Anthropology, PSYC 111 360; SOC 110 306 or 335 or 340 or 361; ANTH 100 or 171 or 172 or 200 ANTH Elective, 300 or higher. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

College of Engineering & Mines

B.S. in Chemical Engineering (p. 326)
B.S. in Civil Engineering (p. 327)
B.S. in Electrical Engineering
B.S. in Geology (p. 332)
B.S. in Mechanical Engineering (p. 333)
B.S. in Petroleum Engineering (p. 333)

Chemical Engineering

B.S. in Chemical Engineering

Freshman Year
Fall
CHEM 221 Fundamentals of Chemistry - Concepts 1 3
CHEM 221L Fundamentals of Chemistry Laboratory 1 1
ENGL 110 College Composition I 3
MATH 165 Calculus I 4
Essential Studies: Arts & Humanities 3
Essential Studies: Social Science 3
Credits 17

Spring
CHE 102 Introduction to Chemical Engineering 2
CHEM 254 Inorganic Chemistry I 1 3
CHEM 254L Inorganic Chemistry I Laboratory 1 1
MATH 166 Calculus II 4
PHYS 251 University Physics I 4
Essential Studies: Arts & Humanities 3
Credits 17

Sophomore Year
Fall
CHE 201 Chemical Engineering Fundamentals 3
ENGL 130 Composition II: Writing for Public Audiences 3
ENGR 201 Statics 3
MATH 265 Calculus III 4
PHYS 252 University Physics II 4
Credits 17

Spring
CHE 206 Unit Operations in Chemical Engineering 3
CHE 232 Chemical Engineering Laboratory I 2 2
CHE 315 Engineering Statistics and Design of Experiments 3
CHEM 340 Survey of Organic Chemistry 3 4
CHEM 340L Survey of Organic Chemistry Laboratory 3 1
MATH 266 Elementary Differential Equations 3
Credits 16

Junior Year
Fall
CHE 301 Introduction to Transport Phenomena 4
CHE 303 Chemical Engineering Thermodynamics 4
CHE 331 Chemical Engineering Laboratory II 2 2
ENGR 206 Fundamentals of Electrical Engineering 3
Technical Elective II 3
Credits 16

Spring
CHE 305 Separations 3
### Civil Engineering

**B.S. in Civil Engineering**

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121 General Chemistry I or Biol 150</td>
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<tr>
<td>CHEM 121L General Chemistry Laboratory I or Biol 150L</td>
<td>1</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101 Graphical Communication</td>
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<tr>
<td>MATH 165 Calculus I</td>
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<td><strong>Total</strong></td>
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#### Spring

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td><strong>17</strong></td>
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</tbody>
</table>

1 CHEM 121/121L are required. CHEM 122 and 122L or Biol 150 and 150L required.

**Additional Requirements:**
- CHE 235 and CHE 335 may be taken in lieu of the CHE 232, CHE 331, CHE 332 sequence.
- CHEM 341/341L may be taken in lieu of CHEM 340/340L.
- Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 301 Civil Engineering Laboratory I</td>
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<tr>
<td>CE 306 Fluid Mechanics</td>
<td>3</td>
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<tr>
<td>CE 351 Structural Mechanics</td>
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</tr>
<tr>
<td>CE 412 Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 202 Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 250 Ethics in Engineering and Science</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

#### Senior Year

<table>
<thead>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

1 CHEM 121/121L are required. CHEM 122 and 122L or Biol 150 and 150L required.

**Additional Requirements:**
- CE Technical Elective: CE Department or non-departmental courses approved by the CE Department.
- CE 414 Foundation Engineering | 3 |
- CE 416 Transportation Engineering | 3 |
- CE 444 Contracts and Specifications | 3 |
- CE 483 Civil Engineering Design II | 2 |
- **Total** | **17** |

**Total Credits:** 134
# Electrical Engineering

**B.S. in Electrical Engineering**

**B.S. in Electrical Engineering with Aerospace Focus** (p. 328)

**B.S. in Electrical Engineering with Biomedical Focus** (p. 329)

**B.S. in Electrical Engineering with Computer Science Focus** (p. 330)

## Junior Year

### First Semester
- **CHEM 121**: General Chemistry I 3
- **CHEM 121L**: General Chemistry I Laboratory 1
- **EE 101**: Introduction to Electrical Engineering 1
- **ENGL 110**: College Composition I 3
- **MATH 165**: Calculus I 4
- **Social Science Elective (SS)** 2,3 3
- **Humanities Elective (A&H)** 2,3 3

**Credits**: 18

### Second Semester
- **EE 201**: Introduction to Digital Electronics 2
- **EE 201L**: Digital Electronics Laboratory 1
- **MATH 166**: Calculus II 4
- **PHYS 251**: University Physics I 4
- **Fine Arts Elective (A&H)** 2,3 3
- **A&H or SS Elective** 2,3 3

**Credits**: 17

## Sophomore Year

### First Semester
- **EE 206**: Circuit Analysis 3
- **EE 206L**: Circuits Laboratory I 1
- **EE 304**: Computer Aided Measurement and Controls 3
- **ENGL 130**: Composition II: Writing for Public Audiences 3
- **MATH 265**: Calculus III 4
- **PHYS 252**: University Physics II 4

**Credits**: 18

### Second Semester
- **EE 313**: Linear Electric Circuits 3
- **EE 313L**: Circuits Laboratory II 1
- **ENGR 460**: Engineering Economy 3
- **MATH 207**: Introduction to Linear Algebra 2
- **MATH 266**: Elementary Differential Equations 3
- **Non EE Elective** 4 3

**Credits**: 15

## Junior Year

### First Semester
- **EE 314**: Signals and Systems 3
- **EE 314L**: Signal and Systems Laboratory 1
- **EE 316**: Electric and Magnetic Fields 3
- **EE 318**: Engineering Data Analysis 3
- **EE 321**: Electronics I 3
- **EE 321L**: Electronics Laboratory I 1

**Credits**: 14

### Second Semester
- **EE 401**: Electric Drives 3
- **EE 401L**: Electric Drives Laboratory 1
- **EE 405**: Control Systems I 3
- **EE 405L**: Control Systems Laboratory 1
- **EE 409**: Distributed Networks 3
- **EE 421**: Electronics II 3

## Senior Year

### First Semester
- **EE 480**: Senior Design I 3
- **Electrical Engineering Elective** 7 3
- **Electrical Engineering Elective** 7 3
- **Non-EE Elective** 4 3

**Credits**: 12

### Second Semester
- **EE 481**: Senior Design II (6) 6 3
- **Electrical Engineering Elective** 7 3
- **Electrical Engineering Elective** 7 3
- **Ethics Elective (A&H or SS)** 2,3,8 3

**Credits**: 12

**Total Credits**: 125

1 – May be waived for transfer students (substitute science credit required).

2 – To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies courses.

3 – To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.

4 – Non-EE Elective choices: Engr 201, Engr 202, Engr 203, ME 301, ME/CE 306, and ME 341, Computer Science, Engineering (including EE), Math, and Physics courses approved by advisor, normally 300 level or higher. Math 308 and Math 321 do not meet the requirements of non-EE Elective. CSci 242, CSci 260, and Math 208 are permitted.

5 – EE 480 meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). Prerequisites: EE 421 and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.

6 – EE 481 meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

7 – Maximum of three credits of EE 490 allowed as an independent study, applicable to both EE and non-EE electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.

8 – The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts Humanities or the Social Sciences. Ethics Elective choices: Phil 250 (AH, Humanities), ChE 340 (SS), and ME 370 (SS).

Some of the following courses may be waived by completing: Introduction to Engineering: ENGR 102

- **EE 101**: Introduction to Electrical Engineering 1
- **EE 201**: Introduction to Digital Electronics 2
- **EE 201L**: Digital Electronics Laboratory 1
- **EE 304**: Computer Aided Measurement and Controls 3
- **EE 397**: Cooperative Education 1-2

III- Grade of “C” or better in all EE courses required for graduation.
# B.S. in Electrical Engineering with Aerospace Focus

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EE 101</td>
<td>Introduction to Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td></td>
<td>Social Sciences Elective (SS)</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>EE 481</th>
<th>Senior Design II</th>
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<tbody>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
<td>4</td>
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<tr>
<td>Fine Arts Elective (A&amp;H)</td>
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<td>Credits</td>
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<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>First Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
<td>3</td>
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<tr>
<td>EE 206L</td>
<td>Digital Electronics Laboratory</td>
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<tr>
<td>EE 304</td>
<td>Computer Aided Measurement and Controls</td>
<td>3</td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<td>PHYS 252</td>
<td>University Physics II</td>
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<tr>
<td>Humanities Elective (A&amp;H)</td>
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<td>Credits</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>AVIT 102</th>
<th>Introduction to Aviation</th>
<th>5</th>
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<tbody>
<tr>
<td>EE 313</td>
<td>Linear Electric Circuits</td>
<td>3</td>
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<td>EE 313L</td>
<td>Circuits Laboratory II</td>
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<td>ENGR 460</td>
<td>Engineering Economy(SS)</td>
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<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
<td>2</td>
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<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
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<tr>
<td>Credits</td>
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<tr>
<th>Junior Year</th>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AVIT 126</td>
<td>Introduction to UAS Operations</td>
<td>2</td>
</tr>
<tr>
<td>EE 314</td>
<td>Signals and Systems</td>
<td>3</td>
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<tr>
<td>EE 314L</td>
<td>Signal and Systems Laboratory</td>
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<tr>
<td>EE 316</td>
<td>Electric and Magnetic Fields</td>
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<tr>
<td>EE 318</td>
<td>Engineering Data Analysis</td>
<td>3</td>
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<tr>
<td>EE 321</td>
<td>Electronics I</td>
<td>3</td>
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<tr>
<td>EE 321L</td>
<td>Electronics Laboratory I</td>
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<td>Credits</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>AVIT 221</th>
<th>Basic Attitude Instrument Flying</th>
<th>3</th>
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<tbody>
<tr>
<td>EE 405</td>
<td>Control Systems I</td>
<td>3</td>
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<td>EE 405L</td>
<td>Control Systems Laboratory</td>
<td>1</td>
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<tr>
<td>EE 421</td>
<td>Electronics II</td>
<td>3</td>
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<td>EE 421L</td>
<td>Electronics Lab II</td>
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<tr>
<td>EE 452</td>
<td>Embedded Systems</td>
<td>3</td>
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<td>EE 452L</td>
<td>Embedded Systems Design Laboratory</td>
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<td>Electrical Engineering Elective</td>
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<tr>
<td>Credits</td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>First Semester</th>
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<tbody>
<tr>
<td>EE 480</td>
<td>Senior Design I</td>
<td>3</td>
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<tr>
<td>Aviation Elective</td>
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<tr>
<td>Electrical Engineering Elective</td>
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</table>

### III-Grade "C" or better in all EE courses required for graduation.

1-May be waived for transfer students (substitute science credit required).

2-To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies courses.

3-To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.

4- Non-EE Elective choices: Engr 201, Engr 202, Engr 203, ME 301, ME/CE 250, ME/CE 306, and ME 341, Computer Science, Engineering (including EE), Math, and Physics courses approved by advisor, normally 300 level or higher. Math 308 and Math 321 do not meet non-EE elective requirements. CSci 242, CSci 260, and Math 208 are permitted.

5-EE 480 meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). EE 480 Prerequisites: EE 421 and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.

6-EE 481 meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

7-Maximum of three credits of EE 490 allowed as an independent study, applicable to both EE and non-EE Electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/ U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.

8-The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts Humanities or the Social Sciences. Ethics Elective choices: Phil 250 (AH, Humanities), Che 340 (SS), and ME 370 (SS).


# B.S. in Electrical Engineering with Biomedical Focus

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 150</td>
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<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
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<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>CHEM 121L</td>
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<tr>
<td>EE 101</td>
<td>Introduction to Electrical Engineering</td>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
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<tr>
<td>Credits</td>
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**University of North Dakota**

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**Non-EE Elective**

**A&H or SS Elective**

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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>First Semester</th>
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<tbody>
<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
</tr>
<tr>
<td>BIOL 151L</td>
<td>General Biology II Laboratory</td>
</tr>
<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
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<td>EE 201L</td>
<td>Digital Electronics Laboratory</td>
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<td>MATH 166</td>
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<tr>
<th>Sophomore Year</th>
<th>First Semester</th>
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<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
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<tr>
<td>EE 313</td>
<td>Linear Electric Circuits</td>
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<tr>
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<table>
<thead>
<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>EE 314</td>
<td>Signals and Systems</td>
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<td>EE 316</td>
<td>Electric and Magnetic Fields</td>
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<td>EE 321</td>
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<tbody>
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<td>EE 405</td>
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<td>EE 409</td>
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<tbody>
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| Total Credits | 128 |

**B.S. in Electrical Engineering with Computer Science Focus**

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<td>General Chemistry I Laboratory</td>
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<td>or Computer Science I</td>
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<tr>
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<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
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<td>Digital Electronics Laboratory</td>
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<td>EE 206L</td>
<td>Circuits Laboratory I</td>
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<tr>
<td>EE 304</td>
<td>Computer Aided Measurement and Controls</td>
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<td>MATH 265</td>
<td>Calculus III</td>
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**Second Semester**

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<tbody>
<tr>
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**Junior Year**

**First Semester**

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<tbody>
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<td>Signals and Systems</td>
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<td>EE 316</td>
<td>Electric and Magnetic Fields</td>
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<td>EE 318</td>
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<tr>
<td>EE 451</td>
<td>Computer Hardware Organization</td>
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**Second Semester**

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<tbody>
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<td>EE 409</td>
<td>Distributed Networks</td>
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<td>EE 421</td>
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<td>EE 421L</td>
<td>Electronics Lab II</td>
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<td>EE 452</td>
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<td>Embedded Systems Design Laboratory</td>
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**Senior Year**

**First Semester**

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<tbody>
<tr>
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<td>MATH 207</td>
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**Second Semester**

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<thead>
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<tr>
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**Junior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
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<td>EE 316</td>
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**Second Semester**

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<thead>
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<tbody>
<tr>
<td>EE 313</td>
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<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
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<td>MATH 266</td>
<td>Elementary Differential Equations</td>
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<tr>
<td>Non EE Elective 4</td>
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Ill-Grade “C” or better in all EE courses required for graduation.

1- May be waived for transfer students (substitute science credit required).

2- To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies courses.

3- To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.

4- EE 480 meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). EE 480 Prerequisites: EE 421 and EE 421L and two out of the four following classes: EE 401, EE 405, EE 409, EE 452.

5- EE 481 meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

6- Maximum of three credits of EE 490 allowed as an independent study, applicable to both EE and non-EE Electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.

7- The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts Humanities or the Social Sciences. Ethics Elective choices: PHIL 250 (AH, Humanities); CHE 340 (SS); and ME 370 (SS).

8- Computer Science Elective choices: Any Computer Science course, 300 level or higher. A maximum of three credits of CSCI 260 is permitted.

**Freshman Year**

**First Semester**

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<tbody>
<tr>
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<td>EE 101</td>
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**Credits**

|         |                                                 | 18     |

**Second Semester**

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<td>MATH 166</td>
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**Credits**

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**Sophomore Year**

**First Semester**

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<td>EE 304</td>
<td>Computer Aided Measurement and Controls</td>
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**Credits**

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**Second Semester**

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<td>Linear Electric Circuits</td>
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<tr>
<td>ENGR 460</td>
<td>Engineering Economy (SS) 2</td>
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<td>Introduction to Linear Algebra</td>
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**Credits**

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**Junior Year**

**First Semester**

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<th>Course Title</th>
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<td>EE 316</td>
<td>Electric and Magnetic Fields</td>
<td>3</td>
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<td>EE 318</td>
<td>Engineering Data Analysis</td>
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**Credits**

|         |                                                 | 14     |

**Second Semester**

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<td>ENGR 460</td>
<td>Engineering Economy (SS) 2</td>
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<tr>
<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
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<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
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<td>Non EE Elective 4</td>
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**Credits**

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University of North Dakota
## Second Semester

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<td>EE 405 Control Systems I</td>
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<td>EE 421 Electronics II</td>
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<tr>
<td>EE 452 Embedded Systems</td>
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**Total Credits:** 12

## Senior Year

### First Semester

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<td>Electrical Engineering Elective</td>
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**Total Credits:** 12

### Second Semester

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<td>Electrical Engineering Elective</td>
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</tr>
<tr>
<td>Electrical Engineering Elective</td>
<td>3</td>
</tr>
<tr>
<td>Ethics Elective (A&amp;H or SS)</td>
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</tr>
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</table>

**Total Credits:** 12

### Fall

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>GEOL 101 Introduction to Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 101L Introduction to Geology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121 General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits:** 19

### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 166 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211 College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211CL College Physics I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 102 The Earth Through Time</td>
<td>3</td>
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<tr>
<td>GEOL 102L The Earth Through Time Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 318 Mineralogy</td>
<td>3</td>
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</tbody>
</table>

**Total Credits:** 16

### Sophomore Year

### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GEOL 220 Computer Applications in Geology</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 256 Critical Thinking in the Geosciences</td>
<td>2</td>
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</tbody>
</table>

**Total Credits:** 16

### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 330 Structural Geology</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective (Math 321, Math 265, or Psych 241)</td>
<td>4</td>
</tr>
<tr>
<td>Arts &amp; Humanities Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 16

### Junior Year

### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 311 Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td>Arts &amp; Humanities</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 16

### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 356 Geoscience Lectures</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 411 Sedimentology and Stratigraphy</td>
<td>5</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td>Geology Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 16

---

1 – May be waived for transfer students (substitute science credit required).

2 – To meet the University’s Essential Studies Breadth of Knowledge requirements, all students must complete 9 credits of Arts Humanities Electives (minimum of 2 departments, including 3 Fine Arts credits and 3 Humanities credits) and 9 credits of Social Sciences Electives (minimum of 2 departments). Refer to the online Academic Catalog for a listing of acceptable Essential Studies coursework.

3 – To meet the University’s Essential Studies Social-Cultural Diversity requirements, all students must complete 3 credits of Global (G) Diversity Electives and 3 credits of United States (U) Diversity Electives. Refer to the online Academic Catalog for a listing of acceptable Essential Studies G and U Diversity Electives.

4 – Non-EE Elective choices: Engr 201, Engr 202, Engr 203, ME 301, ME/CE 306, and ME 341. Computer Science, Engineering (including EE), Math, and Physics courses approved by advisor, normally 300 level or higher.

5 – EE 480 meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C). Prerequisites: EE 421 and EE 421L and two of the following classes: EE 401, EE 405, EE 409, EE 452. EE 481 meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

6 – Maximum of three credits of EE 490 allowed as an independent study, applicable to both EE and non-EE electives. 2 credits of EE 397 Cooperative Education (40 hours/week) is equivalent to 3 credits of the EE Electives with S/U grading, maximum 4 credits of EE 397 is equivalent to maximum of 6 credits of EE Elective.

7 – The Ethics Elective is a 3-credit course that meets Essential Studies requirements in either the Arts Humanities or the Social Sciences. Ethics Elective choices: Phil 250 (AH, Humanities), ChE 340 (SS), and ME 370 (SS). Some of the following courses may be waived by completing: Introduction to Engineering: ENGR 102 EE 101 Introduction to Electrical Engineering 1 EE 201 Introduction to Digital Electronics 2 EE 201L Digital Electronics Laboratory 1
### Social Science Elective

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 421</td>
<td>Seminar I</td>
</tr>
<tr>
<td>GEOL 487</td>
<td>Research I</td>
</tr>
</tbody>
</table>

Determine what type of Senior Thesis project you would like to consider early in your program. Discuss this with your advisor or faculty member you would like to work with.

Geology Elective 1: 3
Approved Elective 2: 3
Approved Elective 2: 3
Social Science Elective: 3

### Credits

**Total Credits:** 125

---

1 = Approved Geology Electives (must complete 2 courses from list) Geol 321 Geochemistry, Geol 414 Applied Geophysics, Geol 415 Intro to Paleontology, GeoE 417 Hydrogeology.

2 = Student is required to complete 22-24 program approved courses in engineering, mathematics, foreign language, and other fields of student interest. There may be an additional approved elective required to complete 125 hours. The B.S. in Geology program is flexible to the extent that students can take different courses to complete graduation requirements (geochemistry or paleontology, for example). The student should meet with their geology advisor early to map out their interests in their degree program.

**^^ Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

---

# Mechanical Engineering

**B.S. in Mechanical Engineering**

### Freshman Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I ¹</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory ¹</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I ¹</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I ¹</td>
</tr>
<tr>
<td>ME 101</td>
<td>Introduction to Mechanical Engineering ¹</td>
</tr>
</tbody>
</table>

Arts and Humanities: 3

**Credits:** 17

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering ¹</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II ¹</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I ¹</td>
</tr>
</tbody>
</table>

Arts and Humanities: 3

**Credits:** 16

---

### Sophomore Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 201</td>
<td>Statics ¹</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III ¹</td>
</tr>
<tr>
<td>ME 201</td>
<td>Student Design</td>
</tr>
<tr>
<td>ME 341</td>
<td>Thermodynamics ¹</td>
</tr>
</tbody>
</table>

**Credits:** 16

---

1 = Must be completed with a grade of 'C' or better.
2 = Another lab science may be substituted for PHYS 253 or CHEM 122 by petition to the ME Department.
3 = One technical elective can be taken outside of the ME Department within another CEM Department, Math or Physics. The course must be at the 300-level or higher.
4 = Arts Humanities if taking ME 370 or CHEE 340 / Social Science if taking PHIL 250.

**^^ Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

### Junior Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 400</td>
<td>Engineering Economy</td>
</tr>
<tr>
<td>ME 301</td>
<td>Materials Science</td>
</tr>
<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>ME 322</td>
<td>Design of Machinery</td>
</tr>
<tr>
<td>Technical Elective ³</td>
<td>3</td>
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</tbody>
</table>

**Credits:** 15

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
</tr>
<tr>
<td>ME 323</td>
<td>Machine Component Design</td>
</tr>
<tr>
<td>ME 323L</td>
<td>Machine Component Design Laboratory</td>
</tr>
<tr>
<td>ME 418</td>
<td>Manufacturing Processes</td>
</tr>
<tr>
<td>ME 474</td>
<td>Fundamentals of Heat and Mass Transfer</td>
</tr>
<tr>
<td>Technical Elective ³</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits:** 17

### Senior Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 480</td>
<td>Mechanical Engineering Seminar</td>
</tr>
<tr>
<td>ME 483</td>
<td>Mechanical Measurements Laboratory</td>
</tr>
<tr>
<td>ME 487</td>
<td>Engineering Design</td>
</tr>
<tr>
<td>Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Technical Electives ³</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits:** 15

**Total Credits:** 129

---

1 = Must be completed with a grade of 'C' or better.
2 = Another lab science may be substituted for PHYS 253 or CHEM 122 by petition to the ME Department.
3 = One technical elective can be taken outside of the ME Department within another CEM Department, Math or Physics. The course must be at the 300-level or higher.
4 = Arts Humanities if taking ME 370 or CHEE 340 / Social Science if taking PHIL 250.

**^^ Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

---

# Petroleum Engineering

**B.S. in Petroleum Engineering**

### Freshman Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I(ES = Q)</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>University Physics II ¹</td>
</tr>
</tbody>
</table>

**Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 202</td>
<td>Dynamics ¹</td>
</tr>
<tr>
<td>ENGR 206</td>
<td>Fundamentals of Electrical Engineering</td>
</tr>
<tr>
<td>ENGR 203</td>
<td>Mechanics of Materials ¹</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
</tr>
<tr>
<td>PHYS 253</td>
<td>University Physics III ²</td>
</tr>
<tr>
<td>or CHEM 122</td>
<td>or General Chemistry II and General Chemistry II Laboratory</td>
</tr>
</tbody>
</table>

**Credits:** 16

### Junior Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ME 400</td>
<td>Engineering Economy</td>
</tr>
<tr>
<td>ME 301</td>
<td>Materials Science</td>
</tr>
<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>ME 322</td>
<td>Design of Machinery</td>
</tr>
<tr>
<td>Technical Elective ³</td>
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</table>

**Credits:** 15

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ME 370</td>
<td>Engineering Disasters and Ethics or CHE 340 or PHIL 250</td>
</tr>
<tr>
<td>or ME 488</td>
<td>or Professional Integrity in Engineering or Ethics in Engineering and Science</td>
</tr>
<tr>
<td>or Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Technical Electives ³</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits:** 16

**Total Credits:** 129

---

1 = Must be completed with a grade of 'C' or better.
2 = Another lab science may be substituted for PHYS 253 or CHEM 122 by petition to the ME Department.
3 = One technical elective can be taken outside of the ME Department within another CEM Department, Math or Physics. The course must be at the 300-level or higher.
4 = Arts Humanities if taking ME 370 or CHEE 340 / Social Science if taking PHIL 250.

**^^ Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
<td>2</td>
</tr>
<tr>
<td>GEOE 210</td>
<td>Earth Dynamics &amp; Geophysics</td>
<td>4</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
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<td><strong>Credits</strong></td>
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</tr>
<tr>
<td>Spring</td>
<td>PTRE 201 As an Alternative, see Fall ENGR 201</td>
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<tr>
<td></td>
<td>MATH 166 Calculus I</td>
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<tr>
<td></td>
<td>PHYS 251 University Physics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CHEM 122 General Chemistry II</td>
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</tr>
<tr>
<td></td>
<td>CHEM 122L General Chemistry II Laboratory</td>
<td>1</td>
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<td><strong>Total Credits</strong></td>
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<tr>
<td>Sophomore Year</td>
<td><strong>Fall</strong></td>
<td><strong>17</strong></td>
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<tr>
<td>ENGR 201</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 301</td>
<td>Reservoir Rock Properties</td>
<td>3</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>University Physics II Including Lab</td>
<td>4</td>
</tr>
<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td></td>
<td>ME 306 Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 311</td>
<td>Petroleum Fluid Properties</td>
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</tr>
<tr>
<td>ENGR 203</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 361</td>
<td>Petroleum Engineering Laboratory I</td>
<td>2</td>
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<tr>
<td>GEOE 407</td>
<td>Petroleum Geology</td>
<td>3</td>
</tr>
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<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Junior Year</td>
<td><strong>Fall</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>PTRE 401</td>
<td>Well Logging</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 431</td>
<td>Reservoir Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 411</td>
<td>Drilling Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies Arts &amp; Humanities Elective (ES = G or U)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 321 or CHE 315 or GEOL 520</td>
<td>Applied Statistical Methods or Engineering Statistics and Design of Experiments or Statistical Applications in Geology</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td></td>
<td>Essential Studies Social Science Elective (ES = G or U)</td>
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<tr>
<td>PTRE 451</td>
<td>Advanced Drilling Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 445</td>
<td>Advanced Reservoir Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Senior Year</td>
<td><strong>Fall</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>PTRE 421</td>
<td>Production Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 465</td>
<td>Petroleum Geomechanics</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 471</td>
<td>Numerical Reservoir Simulation</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 484</td>
<td>Research Design(END = O)</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 405</td>
<td>Petroleum Eng. Economy and Law</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td></td>
<td>CHE 340 Professional Integrity in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 485</td>
<td>Senior Design or Engineering Disasters and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>or ME 370 or PHIL 250</td>
<td>or Ethics in Engineering and Science</td>
<td></td>
</tr>
<tr>
<td>PTRE 462</td>
<td>Petroleum Engineering Laboratory II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Essentials Studies Arts &amp; Humanities Elective (ES = G or U)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>128</strong></td>
</tr>
</tbody>
</table>

ES = represents courses satisfying the Essential Studies requirements of the University. ***Approved Courses for Technical Electives: ***Any geology electives may be used. (-3) / GeoG 474/L Intro to GIS (3) / GeoE 351 Petroleum Development Engr. (3) / GeoE 493 Special Topics in Geo. Engr. / PrE 493 Special Topic in Petroleum Engr: Managing Complex Systems (3), Intro to Hydraulic Fracturing (3), Exploration Methods in Petroleum Engr. (3), Fuels Technology (3) / PrE 461 Natural Gas Engr. (3). Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Environmental Engr.

***All Engineering and Science courses must be completed with a “C” or higher.

College of Nursing and Professional Disciplines

B.S. in Community Nutrition-Nutrition and Foods Option (p. 335)
B.S. in Community Nutrition-Nutrition and Society Option (p. 336)
B.S. in Dietetics (p. 336)
B.S. in Nursing (p. 334)
B.S. in Social Work (p. 337)

Nursing

B.S. in Nursing

Freshman Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115 or CHEM 121</td>
<td>Introductory Chemistry or General Chemistry I</td>
<td>3</td>
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<tr>
<td>CHEM 115L or CHEM 121L</td>
<td>Introductory Chemistry Laboratory or General Chemistry I Laboratory</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<td></td>
<td>Essential Studies Arts/Humanities Elective (ES = G or U)</td>
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Second Semester

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<tbody>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>CHEM 116</td>
<td>Introduction to Organic and Biochemistry</td>
<td>3</td>
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<td>CHEM 116L</td>
<td>Introduction to Organic and Biochemistry Laboratory</td>
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<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
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<td>ANAT 204L</td>
<td>Anatomy for Paramedical Personnel Laboratory</td>
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<tr>
<td>SOC 110 or SOC 115 or ANTH 171</td>
<td>Introduction to Sociology or Social Problems or Introduction to Cultural Anthropology</td>
<td>3</td>
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Sophomore Year

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<tbody>
<tr>
<td>MBIO 202 or MBIO 302</td>
<td>Introductory Medical Microbiology Lecture or General Microbiology Lecture</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 202L or MBIO 302L</td>
<td>Introductory Medical Microbiology Laboratory or General Microbiology Laboratory</td>
<td>2</td>
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<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
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<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology (OR PSYC 250)</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking (Essential Studies: Oral Communication)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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College of Nursing and Professional Disciplines

B.S. in Community Nutrition-Nutrition and Foods Option (p. 335)
B.S. in Community Nutrition-Nutrition and Society Option (p. 336)
B.S. in Dietetics (p. 336)
B.S. in Nursing (p. 334)
B.S. in Social Work (p. 337)
### Nutrition & Dietetics

#### B.S. in Community Nutrition-Nutrition and Foods Option

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
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**Second Semester**

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<td>ANAT 204L</td>
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<tr>
<td>N&amp;D 440</td>
<td>3</td>
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<tr>
<td>N&amp;D 441</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 340</td>
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**Junior Year**

<table>
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<tbody>
<tr>
<td>RHS 200</td>
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<td>COMM 212</td>
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<td>N&amp;D 441</td>
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**Spring**

<table>
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<tbody>
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<td>SOC 326</td>
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<td>PSYC 241</td>
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**Total Credits:** 125

---

Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
## Nutrition & Dietetics

### B.S. in Dietetics

#### Freshman Year

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<thead>
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<th>Fall</th>
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| Credits | 16 |

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<td>CHEM 122L</td>
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| Credits | 16 |

#### Sophomore Year

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| Credits | 16 |

<table>
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<tbody>
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<td>CHEM 340L</td>
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| Credits | 15 |

#### Junior Year

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<td>MGMT 300</td>
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| Credits | 14 |

<table>
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| Credits | 13 |

#### Senior Year

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| Credits | 11 |

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<td>N&amp;D 494</td>
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<tr>
<td>N&amp;D 498</td>
<td>6</td>
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| Credits | 12 |

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| Total Credits | 125 |

---

^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm. A minor is encouraged.

### B.S. in Community Nutrition-Nutrition and Society Option

#### Freshman Year

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
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<tr>
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<td>CHEM 121</td>
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<tr>
<td>CHEM 121L</td>
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| Credits | 16 |

<table>
<thead>
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| Credits | 15 |

#### Junior Year

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| Credits | 14 |

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<thead>
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<tbody>
<tr>
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<tr>
<td>N&amp;D 498</td>
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| Credits | 13 |

#### Senior Year

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| Credits | 11 |

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<th>Credits</th>
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<tbody>
<tr>
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<tr>
<td>MGMT 300</td>
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| Credits | 12 |

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<tbody>
<tr>
<td>N&amp;D 498</td>
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| Total Credits | 125 |

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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Required Courses</th>
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<tbody>
<tr>
<td>CHEM 122 General Chemistry II</td>
<td>3</td>
<td>or CHEM 116 or Introduction to Organic and Biochemistry</td>
</tr>
<tr>
<td>CHEM 122L General Chemistry II Laboratory</td>
<td>1</td>
<td>or Introduction to Organic and Biochemistry Laboratory</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSYC 250 Developmental Psychology</td>
<td>3-4</td>
<td>or T&amp;L 252 Child Development</td>
</tr>
<tr>
<td>Essential Studies Elective in Arts or Humanities</td>
<td>3</td>
<td>Focus on US Diversity course. Recommend SOC 110 however, any other US Diversity course is acceptable</td>
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**Sophomore Year**

**Fall**

<table>
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<tbody>
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<td>N&amp;D 250 Consumer Food Issues</td>
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<td></td>
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<tr>
<td>N&amp;D 335 World Food Patterns</td>
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<tr>
<td>ANAT 204 Anatomy for Paramedical Personnel</td>
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<td>ANAT 204L Anatomy for Paramedical Personnel Laboratory</td>
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<td>COMM 110 Fundamentals of Public Speaking</td>
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**Spring**

<table>
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<th>Required Courses</th>
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<tbody>
<tr>
<td>N&amp;D 220 Foodservice Safety and Sanitation</td>
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<td>RHS 200 Helping Skills in Community Services</td>
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<td>MRKT 201 Personal Marketing</td>
<td>3</td>
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<tr>
<td>CHEM 340 Survey of Organic Chemistry (If CHEM 115 and CHEM 116 were taken then CHEM 340 is not required)</td>
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<td>CHEM 340L Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L have been taken then CHEM 340L is not required)</td>
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<tr>
<td>Essential Studies Elective in Arts and Humanities</td>
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**Junior Year**

**Fall**

<table>
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<tr>
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<tbody>
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<td>PPT 301 Human Physiology</td>
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<td>SOC 326 Sociological Statistics</td>
<td>3</td>
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<tr>
<td>SOC 335 Families in a Changing Society</td>
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<tr>
<td>Essential Studies Elective in Arts and Humanities</td>
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**Spring**

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<td>N&amp;D 348 Sports Nutrition</td>
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<td>N&amp;D 441 Advanced Nutrition</td>
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<tr>
<td>BMB 301 Biochemistry (If CHEM 115 and CHEM 116 were taken then BMB 301 is not required)</td>
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<tr>
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**Senior Year**

**Fall**

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<tbody>
<tr>
<td>N&amp;D 494 Research in Nutrition and Dietetics</td>
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</tr>
<tr>
<td>N&amp;D 497 Supervised Practice in Community Nutrition (Must have a 2.2 GPA, satisfactory completion of service learning requirements, and satisfactory completion of N&amp;D 345. Must have a C or better in your nutrition, foods, and science courses. For summer experiences you must apply by October 15 of the prior year and for fall you must apply by the Friday before spring break.)</td>
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**Electives | 9**

**Social Work**

**B.S. in Social Work**

**Freshman Year**

**First Semester**

<table>
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<th>Course</th>
<th>Credits</th>
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<tr>
<td>PSYC 111 Introduction to Psychology</td>
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<tr>
<td>SOC 110 Introduction to Sociology</td>
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<tr>
<td>BIOL 111 Concepts of Biology</td>
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<tr>
<td>BIOL 111L Concepts of Biology Laboratory</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 115 American Government I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ANTH 171 Introduction to Cultural Anthropology (Or any Essential Studies Approved Global Diversity Course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHIL 101 Introduction to Philosophy (Or any Essential Studies Approved Humanities Course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FA 150 Introduction to the Fine Arts (Or any Essential Studies Approved Fine Arts Course)</td>
<td>3</td>
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</tbody>
</table>

**Credits | 15**

**Sophomore Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 255 Introduction to Social Work</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 103 College Algebra (Or any Essential Studies Approved Quantitative Reasoning Course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSYC 250 Developmental Psychology (Or any Advanced Social Science Course)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Any Essential Studies Approved Fine Arts or Humanities Course</td>
<td>3</td>
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</tr>
</tbody>
</table>

**Credits | 17**

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 257 Human Behavior and the Social Environment I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SWK 493A Special Topics (Social Work Statistics)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSYC 210 Human Sexuality (Or any Advanced Social Science Course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>IS 121 Introduction to American Indian Studies (Or any Essential Studies Approved Global or US Diversity Course)</td>
<td>3</td>
<td></td>
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<tr>
<td>Any Elective Credits</td>
<td>3</td>
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</tbody>
</table>

**Junior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 317 Social Work Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SWK 311 Child Welfare (Or any Social Work Elective)</td>
<td>3</td>
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</tr>
<tr>
<td>SWK 357 Human Behavior and the Social Environment II</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits | 125-126**

---

**Please Note:** Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)
CJ 201 Introduction to Criminal Justice (Or any Advanced Social Science Course) 3
SOC 250 Diversity in American Society (Or any Essential Studies Approved Global or US Diversity Course) 3
Any Elective Credits 3

Credits 18

Second Semester
SWK 424 Generalist Social Work Practice with Individuals and Families 3
SWK 434 Generalist Social Work Practice with Task and Treatment Groups 3
SOC 253 Delinquency and Juvenile Justice (Or any Advanced Social Science Course) 3
Any Elective Credits 9

Credits 18

Senior Year
First Semester
SWK 442 Social Policy 3
SWK 454 Generalist Social Work Practice with Communities and Organizations 3
Any Elective Credits 11

Credits 17

Second Semester
SWK 481 Field Education I 5
SWK 482 Field Education Seminar I 1
SWK 483 Field Education II 5
SWK 484 Field Education Seminar II 1

Credits 12

Total Credits 125

**Advanced Social Science Courses must be a 200-level or above.

This is a sample curriculum and there are other options for some of the courses. Please consult with your adviser for course options.

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John D. Odegard School of Aerospace Sciences

B.S. in Aeronautics (p. 339)

B.S. in Atmospheric Sciences (p. 338)

B.S. in Computer Science (http://und-public.courseleaf.com/4yearplan/aerospaceciences/computerscience)

Atmospheric Sciences

B.S. in Atmospheric Sciences

Freshman Year

Fall Credits
ATSC 100 Atmospheric Sciences Orientation 1
ATSC 110 Meteorology I 3
ATSC 110L Meteorology I Laboratory 1
ENGL 110 College Composition I 3
MATH 165 Calculus I 4
Essential Studies 3
Free Electives 1

Credits 16

Spring
MATH 166 Calculus II 4

Credits 16

CSCI 130 Introduction to Scientific Programming 4
ENGL 130 Composition II: Writing for Public Audiences 3
Essential Studies 3
Free Electives 2

Credits 16

Sophomore Year

Fall
ATSC 210 Introduction to Synoptic Meteorology 4
MATH 265 Calculus III 4
PHYS 251 University Physics I 4
Essential Studies 3

Credits 15

Spring
ATSC 240 Meteorological Instrumentation 4
ATSC 270 Computer Concepts in Meteorology 3
PHYS 252 University Physics II 4
CHEM 121 General Chemistry I 3
CHEM 121L General Chemistry I Laboratory 1

Credits 15

Junior Year

Fall
ATSC 345 Remote Sensing of the Atmosphere 3
ATSC 350 Atmospheric Thermodynamics 3
MATH 266 Elementary Differential Equations 3
PHIL 250 Ethics in Engineering and Science 3
*#Career Electives 4

Credits 16

Spring
ATSC 353 Physical Meteorology 3
ATSC 360 Dynamic Meteorology 4
MATH 321 or ECON 210 Applied Statistical Methods or Introduction to Business and Economic Statistics 3
Essential Studies 6

Credits 16

Senior Year

Fall
ATSC 405 Numerical Methods in Meteorology 3
ATSC 411 Synoptic Meteorology 4
ATSC 492 Senior Project 1
*#Career Electives 4
**Free Electives 1
Essential Studies 3

Credits 16

Spring
ATSC 460 Mesoscale Dynamics 4
ATSC 492 Senior Project 2
*#Career Electives 4
Free Electives 5

Credits 15

Total Credits 125

* Career Electives are courses that students take to gain additional knowledge and skills that would allow them to develop their chosen career interest. A total of 12 credit hours are required from an approved list of classes. Only one lower level Atmospheric Sciences course will be allowed as a Career Elective. # = A maximum combined limit of 6 credit hours of AtSc 397 Cooperative Education, and AtSc 497 Internship, may be used as Career Electives. ^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
## Aviation

**B.S. in Aeronautics with a Major in Air Traffic Control (p. 339)**

**B.S. in Aeronautics with a Major in Aviation Technology Management (p. 339)**

**B.S. in Aeronautics with a Major in Commercial Aviation (p. 340)**

**B.S. in Aeronautics with a Major in Flight Education (p. 341)**

**B.S. in Aeronautics with a Major in Unmanned Aircraft Systems (p. 341)**

### B.S. in Aeronautics with a Major in Air Traffic Control

**Freshman Year**

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 102 Introduction to Aviation</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 260 Air Traffic Control: Tower Operations I</td>
<td>4</td>
</tr>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Math/Sci/Tech</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 100 Aviation Orientation</td>
<td>1</td>
</tr>
<tr>
<td>AVIT 103 Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>ATSC 110 Meteorology I</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L Meteorology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MATH 103 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 208 Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 363 Air Traffic Control: Radar Operations II</td>
<td>4</td>
</tr>
<tr>
<td>COMM 212 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>Electives towards second major/minor</td>
<td>6</td>
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<tr>
<td><strong>Total Credits</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 250 Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 261 Air Traffic Control: Radar Operations I</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies: Humanities</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>15</td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 402 Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 464 Air Traffic Control: Tower and Radar Operations III</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 300 Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>or AVIT 311-Safety Management Systems</td>
<td></td>
</tr>
<tr>
<td>or AVIT 312-Aircraft Accident Invest.</td>
<td></td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Electives towards second major/minor</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 362 Air Traffic Control: Advanced Tower Operations II</td>
<td>4</td>
</tr>
<tr>
<td>ISBC 320 Professional Communication for Business</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 227-Intro to Lit. and Culture</td>
<td></td>
</tr>
<tr>
<td>or ENGL 228-Diversity in Global Lit.</td>
<td></td>
</tr>
<tr>
<td>or ENGL 229-Diversity in U.S. Lit.</td>
<td></td>
</tr>
<tr>
<td>or ENGL 308-Art of Writing Nonfiction</td>
<td></td>
</tr>
<tr>
<td>Essential Studies: Fine Arts or Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Electives towards second major/minor</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 465 Air Traffic Control: Radar and Tower Operations IV</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 468 Aviation Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Electives towards second major/minor</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 403 Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 486 Air Traffic Control: Non-Radar Procedures</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
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<tr>
<td>Electives towards second major/minor</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Total Credits: 125**

---

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at [http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

### B.S. in Aeronautics with a Major in Aviation Technology Management

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 100 Aviation Orientation</td>
<td>1</td>
</tr>
<tr>
<td>AVIT 142 or AVIT 143</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 103 Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Math, Science, and Technologies</td>
<td>2</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts or Humanities</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 208 or AVIT 142 and AVIT 143</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 250 Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 303 or AVIT 261</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies: Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: F</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 208 Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 250 Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Program Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>17</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: F</td>
<td>3</td>
</tr>
<tr>
<td>Program Electives</td>
<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 402 Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>or AVIT 405 or AVIT 407</td>
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---
### B.S. in Aeronautics with a Major in Commercial Aviation

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 100 Aviation Orientation</td>
<td>1</td>
</tr>
<tr>
<td>AVIT 102 Introduction to Aviation</td>
<td>5</td>
</tr>
<tr>
<td>ATSC 110 Meteorology I</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L Meteorology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 221 Basic Attitude Instrument Flying</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 208 Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 103 Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>MATH 146 Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>17</td>
</tr>
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</table>

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 325 Multi-Engine Systems and Procedures</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 309 Flight Physiology</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 320 Professional Communication for Business</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 227 or Introduction to Literature and Culture</td>
<td></td>
</tr>
<tr>
<td>or ENGL 228 or Diversity in Global Literatures</td>
<td></td>
</tr>
<tr>
<td>or ENGL 229 or Diversity in U.S. Literatures</td>
<td></td>
</tr>
<tr>
<td>or ENGL 308 or The Art of Writing Nonfiction</td>
<td></td>
</tr>
<tr>
<td>Social Science Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective Credits</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>14</td>
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</table>

#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 415 Instrument Flight Instructor</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 421 Advanced Aerodynamics</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 428 Transport Category Aircraft Systems</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 430 Crew Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 402 or AVIT 405 or AVIT 407 Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>or Airline Operations and Management</td>
<td></td>
</tr>
<tr>
<td>or General Aviation Operations and Management</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>15</td>
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</tbody>
</table>

#### Credits

- Total Credits: 125
# B.S. in Aeronautics with a Major in Flight Education

## Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>AVIT 221</td>
<td>Basic Attitude Instrument Flying</td>
</tr>
<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
</tr>
<tr>
<td>AVIT 103</td>
<td>Introduction to Air Traffic Control</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
</tr>
<tr>
<td>Free Electives</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>AVIT 100</td>
<td>Aviation Orientation</td>
</tr>
<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
</tr>
<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
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## Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>AVIT 323</td>
<td>Aerodynamics - Airplanes</td>
</tr>
<tr>
<td>AVIT 324</td>
<td>Aircraft Systems</td>
</tr>
<tr>
<td>AVIT 309</td>
<td>Flight Physiology</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
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<tr>
<td>Essential Studies: Humanities</td>
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</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
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<tr>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Fall</td>
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</tr>
<tr>
<td>AVIT 322</td>
<td>IFR Regulations and Procedures</td>
</tr>
<tr>
<td>AVIT 250</td>
<td>Human Factors</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
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<td>Essential Studies: Fine Arts</td>
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## Junior Year

<table>
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<tbody>
<tr>
<td>Spring</td>
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<tr>
<td>AVIT 333</td>
<td>UAS Remote Sensing</td>
</tr>
<tr>
<td>ATSC 231</td>
<td>Aviation Meteorology</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
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<td>Electives</td>
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<tr>
<td><strong>Total Credits</strong></td>
<td><strong>15</strong></td>
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<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>AVIT 407</td>
<td>General Aviation Operations and Management</td>
</tr>
<tr>
<td>AVIT 415</td>
<td>Instrument Flight Instructor</td>
</tr>
<tr>
<td>AVIT 490</td>
<td>Methods and Materials in Teaching Aviation I</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
</tr>
<tr>
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## Senior Year

<table>
<thead>
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<tr>
<td>Spring</td>
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<tr>
<td>AVIT 491</td>
<td>Methods and Materials in Teaching Aviation II</td>
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## B.S. in Aeronautics with a Major in Unmanned Aircraft Systems

<table>
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<th>Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Spring</td>
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</tr>
<tr>
<td>AVIT 221</td>
<td>Basic Attitude Instrument Flying</td>
</tr>
<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
</tr>
<tr>
<td>AVIT 103</td>
<td>Introduction to Air Traffic Control</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
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<tr>
<td>Essential Studies: Social Science</td>
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<tr>
<td>Electives</td>
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<tr>
<td><strong>Total Credits</strong></td>
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<tr>
<td>Fall</td>
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</tr>
<tr>
<td>AVIT 100</td>
<td>Aviation Orientation</td>
</tr>
<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
</tr>
<tr>
<td>AVIT 126</td>
<td>Introduction to UAS Operations</td>
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<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>Sophomore Year</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>AVIT 323</td>
<td>Aerodynamics - Airplanes</td>
</tr>
<tr>
<td>AVIT 324</td>
<td>Aircraft Systems</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>Essential Studies: Humanities</td>
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</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
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</tr>
<tr>
<td>Electives</td>
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</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>AVIT 407</td>
<td>General Aviation Operations and Management</td>
</tr>
<tr>
<td>AVIT 415</td>
<td>Instrument Flight Instructor</td>
</tr>
<tr>
<td>AVIT 490</td>
<td>Methods and Materials in Teaching Aviation I</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
</tr>
<tr>
<td>Free Electives</td>
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<tr>
<td><strong>Total Credits</strong></td>
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^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
AVIT 331  UAS Flight Systems  3
AVIT 332  UAS Ground Systems  3
CSCI 290  Cyber-Security and Information Assurance  3
ENGL 227  Introduction to Literature and Culture  3
 or ENGL 228-Diversity in Global Lit.
 or ENGL 229-Diversity in US Lit.
 or ENGL 308-Art of Writing Nonfiction
 or ISBC 320-Prof Comm for Business

Credits  16

Senior Year

Spring
AVIT 430  Crew Resource Management  3
AVIT 485  Aviation Senior Capstone  3
Electives  9

Credits  15

Fall
AVIT 403  Aerospace Law  3
AVIT 438  UAS Operations  4
Essential Studies: Social Science  3
Electives  6

Credits  16

Total Credits  125

^^ Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

Computer Science

B.S. in Computer Science

Freshman Year

Fall
Credits
CSCI 160  Computer Science I  4
MATH 107  Precalculus  4
ENGL 110  College Composition I  3
E.S. Humanities Elective  3

Credits  14

Spring
CSCI 161  Computer Science II  4
MATH 208  Discrete Mathematics  3
COMM 110  Fundamentals of Public Speaking  3
E.S. Social Science Elective  3
ENGL 130  Composition II: Writing for Public Audiences  3

Credits  16

Sophomore Year

Fall
Credits
CSCI 242  Algorithms and Data Structures  3
CSCI 289  Social Implications of Computer Technology  3
EE 201  Introduction to Digital Electronics  2
EE 202  Electrical Engineering Laboratory  1
MATH 165  Calculus I  4
E.S. Fine Arts Elective  3

Credits  16

Spring
CSCI 230  Systems Programming  3
CSci Elective  3
MATH 166  Calculus II  4
Approved Science Elective  3
E.S. Social Science Elective  3

Credits  16

Junior Year

Fall
CSCI 363  User Interface Design  3
CSci Elective  3
MATH 321  Applied Statistical Methods  3
Lab Science I  4
E.S. Social Science Elective  3

Credits  16

Spring
CSCI 365  Organization of Programming Languages  3
CSCI 370  Computer Architecture  4
Approved Math Elective  3
Lab Science II  4
E.S. Humanities Elective  3

Credits  17

Senior Year

Fall
CSCI 435  Formal Languages and Automata  3
CSCI 451  Operating Systems I  3
CSCI 492  Senior Project I  2
CSci Elective  3
UND Electives  5

Credits  16

Spring
CSCI 493  Senior Project II  2
CSci Elective  3
Approved Science Elective  3
UND Electives  6

Credits  14

Total Credits  125

^^Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

School of Medicine and Health Sciences

B.S. in Athletic Training (p. 342)

B.S. in Medical Laboratory Science (p. 343)

Athletic Training (Family Medicine)

B.S. in Athletic Training

Freshman Year

Fall
Credits
BIOL 150  General Biology I(Must be taken in fall semester)  3
MED 205  Medical Terminology  1
BIOL 150L  General Biology I Laboratory(Must be taken in fall semester)  1
ENGL 110  College Composition I  3
PSYC 111  Introduction to Psychology  3
MATH 103  College Algebra(or tested out on math placement exam/ACT score)  3
SMED 101  Orientation to Athletic Training(Should be taken in the fall semester)  1

Credits  15

Spring
KIN 110  First Aid and CPR  1
**Medical Laboratory Science**

**B.S. in Medical Laboratory Science**

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150 General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150L General Biology I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 121 General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103 College Algebra</td>
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**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLS 101 Orientation to Medical Laboratory Sciences</td>
<td>2</td>
</tr>
<tr>
<td>ANAT 204 Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 202 Introductory Medical Microbiology Lecture</td>
<td>3</td>
</tr>
<tr>
<td>COMM 212 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111 Introduction to Psychology (or Social Science Elective)</td>
<td>3</td>
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**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLS 301 Immunology</td>
<td>3</td>
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<tr>
<td>MLS 325 Hematology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 340 Survey of Organic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 340L Survey of Organic Chemistry Laboratory</td>
<td>1</td>
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<tr>
<td>PPT 301 Human Physiology</td>
<td>4</td>
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<tr>
<td>SOC 110 Introduction to Sociology (or social science elective)</td>
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**Senior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLS 340 Molecular Diagnostics</td>
<td>2</td>
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<tr>
<td>MLS 340L Molecular Diagnostics Laboratory</td>
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<tr>
<td>MLS 380 Professional Issues in Clinical Laboratory Science</td>
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<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>MLS 394</td>
<td>Medical Microbiology</td>
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<td>BMB 301</td>
<td>Biochemistry</td>
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<td>MGMT 300</td>
<td>Principles of Management</td>
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<td>Essential Studies: Humanities Elective</td>
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### Professional Year 2

#### Summer

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<th>Course Title</th>
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<tr>
<td>MLS 471</td>
<td>Clinical Chemistry I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 472</td>
<td>Pre-analytical Skills</td>
<td>1</td>
</tr>
<tr>
<td>MLS 473</td>
<td>Clinical Hemostasis I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 474</td>
<td>Clinical Urinalysis I</td>
<td>2</td>
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<tr>
<td>MLS 477</td>
<td>Clinical Immunohematology I</td>
<td>1</td>
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<tr>
<td>MLS 477L</td>
<td>Clinical Immunohematology I Lab</td>
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<tr>
<td>MLS 478</td>
<td>Clinical Microbiology I</td>
<td>2</td>
</tr>
<tr>
<td>MLS 479</td>
<td>Clinical Hematology I</td>
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#### Fall

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<tr>
<td>MLS 480</td>
<td>Clinical Immunohematology II</td>
<td>2</td>
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<tr>
<td>MLS 481</td>
<td>Clinical Chemistry II</td>
<td>2</td>
</tr>
<tr>
<td>MLS 483</td>
<td>Clinical Hemostasis II</td>
<td>1</td>
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<tr>
<td>MLS 484</td>
<td>Clinical Microbiology II</td>
<td>2</td>
</tr>
<tr>
<td>MLS 485</td>
<td>Clinical Urinalysis II</td>
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<tr>
<td>MLS 487</td>
<td>Medical Mycology</td>
<td>1</td>
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<tr>
<td>MLS 488</td>
<td>Clinical Hematology II</td>
<td>2</td>
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<tr>
<td>MLS 489</td>
<td>Clinical Body Fluids</td>
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#### Spring

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<th>Course Title</th>
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<tr>
<td>MLS 490</td>
<td>Financial and Quality Management of the Clinical Laboratory</td>
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<tr>
<td>MLS 491</td>
<td>Clinical Chemistry III</td>
<td>2</td>
</tr>
<tr>
<td>MLS 492</td>
<td>Clinical Immunohematology III</td>
<td>2</td>
</tr>
<tr>
<td>MLS 494</td>
<td>Clinical Immunology</td>
<td>1</td>
</tr>
<tr>
<td>MLS 495</td>
<td>Clinical Microbiology III</td>
<td>2</td>
</tr>
<tr>
<td>MLS 498</td>
<td>Clinical Hematology III</td>
<td>2</td>
</tr>
<tr>
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<td><strong>Credits</strong></td>
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**Total Credits 126**

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Please Note: Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm
Graduate Academic Information

School of Graduate Studies Information (p. 345)
Admissions Policies and Procedures (p. 346)
Academic Policies and Procedures (p. 349)
Degrees and Degree Requirements (p. 358)
Research (p. 354)
Academic Grievances (p. 369)
Graduate Programs and Courses (p. 372)

The School of Graduate Studies

Grant McGimpsey, Dean

Mission

The School of Graduate Studies has responsibility for all graduate work at the University except for that leading to the Doctor of Medicine (M.D.) and Juris Doctorate (J.D.). It is the purpose of the School of Graduate Studies to provide opportunity for advanced study beyond the limits of undergraduate courses, to make available the resources of the University in such combinations as will meet the occupational, intellectual, and cultural needs of qualified post-baccalaureate students, and to encourage original investigation and creative scholarship. The University of North Dakota offers the largest and most diversified graduate school in the region. A number of unique facilities and support resources augment the instructional and research program. In addition, the School of Graduate Studies offers extensive off-campus program offerings through the Division of Continuing Education.

The School of Graduate Studies: General Information

The School of Graduate Studies provides qualified post-baccalaureate students with the opportunity for advanced study toward a graduate degree or certificate. The School of Graduate Studies promotes excellence in scholarship and creativity, and encourages original research and competency in technical and professional fields. The School of Graduate Studies is responsible for general supervision of all graduate activity in the departments, schools, and colleges of the University.

Graduate level courses are offered through various delivery modes. Opportunities for on-campus, online, and combinations of on-campus/online study exist for many programs. Students should consult with individual programs or the School of Graduate Studies for information regarding on-campus and online programming. Students wishing to enroll in distance courses and programs must follow all School of Graduate Studies policies and procedures.

The School of Graduate Studies is a member of the Midwest Association of Graduate Schools, the Western Association of Graduate Schools, the American Indian Professional Association, the Association for Graduate Enrollment Management, the Center for Academic Integrity, the American Association of Collegiate Registrars and Admissions Officers, and the Midwestern Association of Graduate Admissions Professionals. The School of Graduate Studies is one of the one hundred charter members of the Council of Graduate Schools in the United States.

The Dean is the chief administrative officer of the School of Graduate Studies. School of Graduate Studies policy is set by the Graduate Faculty which is made up of the President, the Vice President for Academic Affairs, the Dean of the School of Graduate Studies, and members of the University faculty who have been approved for membership on the Graduate Faculty. A full listing of the Graduate Faculty is available on the School of Graduate Studies website: http://graduateschool.und.edu. Only members of the Graduate Faculty normally may serve on Faculty Advisory Committees and serve as advisors for graduate students.

School of Graduate Studies: Academic Programs

Graduate degrees are offered within seven Colleges or Schools as listed below:


College of Business and Public Administration: Applied Economics, Business Administration, and Public Administration


School of Medicine and Health Sciences: Biomedical Sciences, Clinical and Translational Science, Medical Lab Science, Occupational Therapy, Physical Therapy, Physician Assistant Studies, Public Health

The Graduate Committee

The Graduate Committee is the executive council of the Graduate Faculty. In this capacity it is advisory to the Dean of the School of Graduate Studies and serves as the School of Graduate Studies Curriculum Committee. The Graduate Committee is responsible for hearing appeals of decisions on student academic matters rendered by the Dean of the School of Graduate Studies. The voting membership of the Graduate Committee consists of thirteen full members of the Graduate Faculty. These thirteen members of the Graduate Committee are elected by those members of the Graduate Faculty from each of thirteen academic areas, with each person elected to serve a three-year term. Non-voting ex officio members of the Graduate Committee include the Dean of the School of Graduate Studies, any Associate Dean(s), and the appointed graduate student member. The graduate student member must be enrolled in the School of Graduate Studies and will serve a one-year term. The membership roster of the Graduate Committee is available from the School of Graduate Studies and is posted on the School of Graduate Studies website.

Assessment

As an institution of higher education, the university is committed to ongoing assessment of student learning at all levels and in all programs. Assessment of student learning is essential in order for the University to improve educational programs and the experiences of students. Students and faculty are encouraged to respond when asked to participate in surveys and other assessment activities. Students are also encouraged to collaborate in the planning and development of assessment activities and to make suggestions for improvements.

Degrees Granted

The degrees conferred for graduate work are the Master of Arts (M.A.), Master of Physician Assistant Studies (M.P.A.S.), Master of Science (M.S.), Master of Education (M.Ed.), Master of Business Administration (M.B.A.), Master of
Admissions Policies and Procedures

Application for Admission to School of Graduate Studies

Those who have earned or will earn a four-year bachelor’s degree at a regionally accredited college or university in the United States, or the equivalent of this degree in another country, will be considered for admission to the School of Graduate Studies at UND. Exceptions to this policy must be approved by the Dean of the School of Graduate Studies.

Applicants may apply for admission to the University of North Dakota during their final year of undergraduate study, but must furnish proof of graduation before registration.

The School of Graduate Studies application process is entirely online. For more information, contact the School of Graduate Studies or visit us online:

School of Graduate Studies Admissions
University of North Dakota
264 Centennial Drive, Stop 8178
Grand Forks, ND 58202-8178
Phone (701) 777-2947, 1-800-CALL-UND
FAX (701) 777-3619
E-mail: Questions@gradschool.und.edu
http://graduateschool.und.edu

Application Deadlines

The University of North Dakota maintains deadlines for all graduate programs; however, applicants are encouraged to apply as early as possible to assure a complete review and full consideration for financial aid. The School of Graduate Studies does not guarantee that applications received less than three weeks before the beginning of the semester will be able to be acted on in time for the beginning of the semester. Many programs have specific application deadlines. The School of Graduate Studies website provides the most current list of deadlines. Applicants should consult this website for program specific application deadlines.

NOTE: It is strongly recommended that domestic applicants submit and complete an application at least three weeks prior to the program deadlines. The School of Graduate Studies recommends that international applicants submit applications three months in advance of program deadlines.

Applications are complete when all materials required by the program, e.g., transcripts, recommendation letters, official test scores, written statements, etc., have been received by the School of Graduate Studies. It is the responsibility of the applicant to ensure that all required admissions materials are sent to the School of Graduate Studies.

Application Procedure

Those who wish to be considered for graduate study are required to submit an application and supporting materials to the School of Graduate Studies. Applicants are required to use the online application which is available at: http://graduateschool.und.edu. All applicants are required to submit the following:

1. application form;
2. application fee;
3. three letters of recommendation;
4. one official copy of all academic transcripts; and
5. statement of Goals and Objectives.

Additional information, such as writing samples, test scores, portfolios, etc., may be requested by some departments. An application fee is required for each application submitted. The application fee is waived for McNair Scholars.

Applicants are encouraged to contact the School of Graduate Studies or the individual program with any questions regarding the application process.
Minimum General School of Graduate Studies Admission Requirements

1. A four-year bachelor’s degree or equivalent from a regionally accredited college or university (for U.S. degrees, accreditation by MSA, NASC, NCA, NEASC-CHE, SACS-CC, or WACS, Sr.). Exceptions to this policy must be approved by the Dean of the School of Graduate Studies. For combined degree programs, refer to the admission requirements under each department.

2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work (2.5 for M.Engr.) or a GPA of at least 3.00 for the junior and senior years of undergraduate work (based on A = 4.00).

3. ADMISSIONS TESTS. All graduate admissions tests (GMAT, GRE, TOEFL, etc.) must be sent directly by the Testing Service. The institution code for the University of North Dakota is 6878 for the GRE, TOEFL, and GMAT. The institution code for the MAT is 1380. Photocopies of test scores are not accepted. Not all graduate programs require testing for admission. Please consult the School of Graduate Studies website (http://graduateschool.und.edu) for current information on admission tests.

4. All graduate applicants must demonstrate academic-level proficiency with the English language before they will be considered for approved status admission. This requirement must be met by all applicants, regardless of citizenship, residency, or nation of birth. No applicants will be considered for approved admission status until the English Language Proficiency Requirement has been met. The English Proficiency Requirement will not be waived for any reason. This requirement may be satisfied in any of the following ways:
   a. A bachelor’s degree or higher from a recognized institution in the United States, England, Scotland, Ireland, Wales, Jamaica, Australia, New Zealand, or English Speaking Canada;
   b. An overall band score on the IELTS of at least 6.0;
   c. A satisfactory score on the Test of English as a Foreign Language (TOEFL). For the internet-based TOEFL (TOEFL iBT) an overall score of 76 is required.
   d. Successful completion of English Language Service (ELS) Language Center’s Intensive Level 112.

The programs below require additional and/or higher scores on the TOEFL test to be considered for admission.

<table>
<thead>
<tr>
<th>Program</th>
<th>IBT</th>
<th>Listening</th>
<th>Writing</th>
<th>Reading</th>
<th>Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Economics</td>
<td>79</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>76</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Business Administration</td>
<td>79</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>College Teaching</td>
<td>76</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Communications and Public Discourse</td>
<td>76</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Earth System Science and Policy</td>
<td>76</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Educational Foundations and Research</td>
<td>76</td>
<td>23</td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Educational Studies</td>
<td>76</td>
<td>23</td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>76</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>English Language Learner</td>
<td>76</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nursing (degrees and certificates) 76 26 26
Physical Therapy 89 18 24 21 26
Physician Assistant Studies 93
Public Administration (degrees and certificates) 79
Teaching and Learning 76 19 17 19 21

Graduate Teaching Assistants must be proficient English language communicators. Language proficiency will be established on the basis of the Internet Based TOEFL (IBT) by earning a score of at least 26 on the spoken section, or on the basis of the IELTS test by scoring an overall band score of 6.5. The applicant must meet all other admission requirements. Contact the School of Graduate Studies for more information.

Application Policies

Applications are considered only for the program, degree, and admit term indicated on the application. A person must submit separate applications for each program, degree, and admit term he or she wishes to be considered for admission. An applicant may change the program, degree, and/or admit term of a submitted application one time, but not after an admission decision has been published regarding the application.

Applications for which the School of Graduate Studies has not received all of the required application materials and have a status of incomplete at the fourth week census of the semester indicated on the application are administratively denied.

Some programs have additional admission requirements or require supplemental information at the time of application. Please consult the individual program listings in this catalog or contact the School of Graduate Studies for more information.

Students who meet all of the stated admission requirements are eligible for consideration for Approved Status admission, but are not guaranteed admission. The entering classes will be chosen from all qualified applicants on the basis of the quality of the applicants’ previous work, the adequacy of their preparation for graduate study at UND, and enrollment capacity. The School of Graduate Studies reserves the right to refuse admission to any applicant on the basis of scholastic or other reasons. Applicants who do not meet all of the requirements for Approved admission may be considered for Provisional admission status.

Application Materials

Transcripts, references, and/or any other materials sent prior to submission of an application will be kept active for six months. Applicants should send all application materials directly to the School of Graduate Studies, not to the program to which they are applying.

It is the applicant’s responsibility to ensure that the School of Graduate Studies has received all application materials; therefore, periodically checking on the status of the application by the applicant is advisable. Once an application is complete, it will be forwarded to the program for evaluation. Each graduate program makes its own admission recommendation, but the decision is not final until it has been reviewed and approved by the Dean of the School of Graduate Studies.

The School of Graduate Studies will use transcripts which were received officially so long as the transcripts have been retained according to UND’s Records Retention Policy. Because written statements (statement, goals, essays, etc.) and letters of recommendation are written to a specific program, an applicant must provide new written statements and letters of recommendations for each application. Because test scores have expiration...
Categories of Admission

Applicants for degree or certificate programs may be admitted to Approved, Qualified, Provisional, or Deferred status. The School of Graduate Studies has established minimal academic criteria for admission. Individual departments may have additional requirements. The various categories of admission are detailed in the following paragraphs.

Approved Status

Students admitted to Provisional status because of their previous GPA will be eligible for advancement to Approved status after the completion of nine semester hours of graduate level coursework if their GPA for all work attempted is at least 3.00. Students in a Provisional status may be dismissed after one registration if their GPA is below 3.00, or if they have failed to meet other conditions specified at the time of admission.

The first obligation of students admitted to Provisional status is to meet all of the conditions specified at the time of admission. Students in Provisional status are eligible for graduate assistantships and tuition waivers at the discretion of the department.

Conditional Status

Admission to Conditional status may be granted to an applicant who has not met one or more of the general School of Graduate Studies or program level admission requirements, e.g., low G.P.A., low test scores, lack of a required test, or other concerns about the applicant’s ability to succeed in graduate study. Generally, students will not be admitted into Provisional status with more than nine (9) credits of outstanding prerequisites.

Eligibility to Work for an Advanced Degree

Eligibility to Work for an Advanced Degree

Only those who have been officially admitted to the School of Graduate Studies as Degree Students on the basis of a letter from the Dean of the School of Graduate Studies may work for an advanced degree. Any conditions stipulated in the admission letter must be satisfied according to the terms of the degree or certificate students who do not satisfy the conditions of the admission letter will be dismissed. Students may petition the School of Graduate Studies for an extension if they are unable to satisfy the conditions of admission. Such petitions must be filed prior to any deadlines that are in the admissions letter.

Matriculation

Delaying or Moving Matriculation

An applicant offered admission to a degree or certificate program in the School of Graduate Studies may request to delay or move his/her matriculation into the program for up to one year. Requests to delay or move matriculation will require approval of the program faculty and the School of Graduate Studies. There is no guarantee that students denied delayed matriculation will be offered admission at a later date.

Eligibility for Faculty to Pursue Graduate Degree

Eligibility for Faculty to Pursue Graduate Degree

A faculty member at any rank may take coursework toward a degree at the University if he or she has the approval of the dean of his or her college or school. Members of the Graduate Faculty must also obtain approval of the Graduate Dean. Upon enrollment in a graduate program, graduate faculty membership, and faculty rank or role in any department in which the coursework is being taken, will be suspended. The suspended faculty rank and role, including graduate faculty membership, will be automatically reinstated upon completion of the graduate degree or departure from the degree program. Any member of the faculty may, with the approval of the dean and of the instructors concerned, take courses for credit as non-degree seeking students without changing his or her faculty status. Arrangements need to be made through the School of Graduate Studies and/or Registrar’s Office. (Reference: UND Faculty Handbook)

Eligibility to Work for an Advanced Degree

Eligibility to Work for an Advanced Degree

Only those who have been officially admitted to the School of Graduate Studies as Degree Students on the basis of a letter from the Dean of the School of Graduate Studies may work for an advanced degree. Any conditions stipulated in the admission letter must be satisfied according to the terms of the letter. Degree or certificate students who do not satisfy the conditions of the admission letter will be dismissed. Students may petition the School of Graduate Studies for an extension if they are unable to satisfy the conditions of admission. Such petitions must be filed prior to any deadlines that are in the admissions letter.

Note to International Students

It is strongly recommended that the application be completed three months prior to the term in which the applicant wishes to matriculate. In general, the following guidelines indicate the level of preparation expected of all international applicants for admission to UND:
India, Pakistan, Bangladesh, Nepal: 1st Class Bachelor’s degree in engineering or medicine with a minimum of four years of study; master’s degree in all other fields.

Other Asian countries: Bachelor’s degree requiring a minimum of four years of study.

British or British-patterned education: Bachelor’s degree with honors with a minimum of four years of study.

French or French-patterned education: Diplome with a minimum of four years of post-baccalaureate study.

Other European, Latin American, Middle Eastern countries or Canada: University degree requiring a minimum of four years of study.

Three-year Bologna process degrees from countries within the European Union will be considered on an individual basis. Three-year degrees from other countries may also be considered. Applicants may be requested to provide a credential course-by-course transcript evaluation in addition to official transcripts from their university.

All graduate applicants must demonstrate academic-level proficiency with the English language before they will be considered for approved admission status. This requirement must be met by all applicants, regardless of citizenship, residency, or nation of birth. The English Proficiency Requirement will not be waived for any reason.

International students are required to submit a certification of finances to the Office of International Programs after an offer of admission has been made. Approximately $35,000 annually is required for educational and living expenses.

Applicants admitted to a graduate program will be issued an I-20 Form after all required documentation has been submitted.

Academic Policies and Procedures

Academic Standards, Probation, Dismissal (p. 349)

Challenge Examinations (p. 349)

Common Course Numbers (p. 349)

Continuing Enrollment - 996 (p. 349)

Correspondence and Online Students (p. 350)

Enrolling in More Than One Program (p. 350)

Faculty Appointments (p. 350)

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Graduate Cooperative Education (p. 352)

Graduate Credit (p. 352)

Graduate Application for Degree or Diploma (p. 353)

Leave of Absence (p. 353)

Maximum and Minimum Academic Load (p. 353)

Maximum Period Allowed and Revalidation of Courses (p. 353)

Minors and Cognates (p. 353)

Program of Study (p. 354)

Registration Policies and Procedures (p. 354)

Residence Requirements (p. 355)

Academic Standards, Probation and Dismissal

A cumulative grade point average (GPA) of at least 3.00 for all work taken as a graduate student (2.75 for M.Eng.) while registered in the UND School of Graduate Studies must be maintained in order to remain in satisfactory academic standing in the School of Graduate Studies. In addition to maintaining the required GPA, satisfactory performance also includes, but is not limited to, satisfactory research performance, a satisfactory GPA in the major, satisfactory performance in examinations, such as the comprehensive examination, or satisfactory performance in other specific program requirements.

The academic standing and progress of degree seeking Students will be reviewed by the departments and Faculty Advisory Committee periodically to ensure that appropriate progress is being made toward the degree.

The academic standing of all graduate students whose cumulative GPA falls below 3.00 (2.75 for Master of Engineering program) will be reviewed at the end of each academic term by the Dean of the School of Graduate Studies. Students having accumulated 9 or more credit hours will be placed on academic probation for one semester; students having accumulated fewer than 9 credit hours will be placed on academic probation until either

1. the GPA is raised to at least 3.00 (2.75 for M.Engr.) or
2. 9 graduate credit hours are accumulated, whichever occurs first.

If, at the end of the probationary period, the GPA is still less than 3.00 (2.75 for M.Engr.), the student will be dismissed.

Students may be dismissed from the School of Graduate Studies for failure to maintain the required academic standing as described in this graduate catalog. Dismissal from the School of Graduate Studies will be noted on the transcript. The Graduate Committee will hear grievances brought by graduate students regarding dismissal decision made by the Dean of the School of Graduate Studies. No decision on dismissal will be reached until a minimum of 9 graduate credits has been accumulated. A student who has been dismissed from the School of Graduate Studies will not be allowed to take any graduate courses or enter any graduate program at the School of Graduate Studies.

Challenge Examinations

Students who believe they are eligible to establish credit for courses because of superior preparation may apply to take challenge examinations. Application should be made on a School of Graduate Studies petition form to the instructor of the course and must be approved by the student’s department and the Dean of the School of Graduate Studies before it may be submitted to the Office of the Registrar. If the application is approved, a committee of that department will administer the examination and will report a grade of either Satisfactory or Unsatisfactory. Challenge examinations will not be permitted for courses which were audited or for courses which were dropped, nor will they be permitted for a student who is not currently enrolled. Certain fees may apply.

Common Course Numbers

Course numbers for certain activities are uniform throughout the School of Graduate Studies and are not listed separately for each department:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>995</td>
<td>Scholarly Project</td>
<td>2</td>
</tr>
<tr>
<td>996</td>
<td>Continuing Enrollment</td>
<td>1-12</td>
</tr>
<tr>
<td>997</td>
<td>Independent Study Report</td>
<td>2-4</td>
</tr>
<tr>
<td>998</td>
<td>Thesis</td>
<td>4-9</td>
</tr>
<tr>
<td>999</td>
<td>Dissertation, typically</td>
<td>6-18</td>
</tr>
</tbody>
</table>
Continuing Enrollment - 996

Students who previously have registered for all of the necessary credits of coursework, research, Scholarly Project (995), Independent Study (997), Thesis (998), or Dissertation (999) on their approved Program of Study, but who have not completed their independent study, thesis, or dissertation, must register for 996. Continuing Enrollment each additional semester or summer session they are utilizing university facilities or the time of the faculty, laboratories, libraries, examinations, advisement, etc. The number of credits should be determined by the advisor to reflect the proportion of time devoted by the student to academic study that term. Graduate Assistants must register for at least six (6) credits which may include a combination of formal coursework and continuing enrollment credits. Advisor verification of the appropriateness of the number of 996 credits may be required.

A master's student may enroll in two regular semesters of 6 to 9 credits of 996 and a doctoral student may enroll in four regular semesters of 6 to 9 credits of 996. A regular semester is defined as the spring or fall term. A student wishing to enroll in additional 996 credits will be required to petition the School of Graduate Studies. Continuing Enrollment (996) credits will not count toward the requirements for the degree. All students must be enrolled for either 996 credits or other credits in the semester of graduation. Students may register for both regular credits and 996 credits in a given term if all other conditions have been met. Continuing Enrollment credits may be used to define a student’s enrollment status, (i.e., part-time or full-time). The fee for Continuing Enrollment (996) cannot be waived.

Correspondence and Online Studies

Correspondence study work is not accepted for graduate credit. With the consent of the student’s major department, the advisor, and the Dean of the School of Graduate Studies, a student may take work by correspondence to remove deficiencies in the undergraduate background.

Enrolling in More than One Program

Students may enroll in a degree program and a certificate program at the same time and use all credits toward both programs if applicable.

Students may enroll in more than one degree program at the same time. To work toward two degrees at the same time, the student must apply and be accepted to both programs; must submit a separate program of study for each degree; and must form two separate advisory committees. Courses agreed upon by both committees may be applied to both programs.

Faculty Appointments

Faculty Advisor Appointments

Students must obtain the appointment of an advisor from the major department. The advisor must be a member of the Graduate Faculty and will be appointed by the Dean of the School of Graduate Studies upon the written recommendation of the chairperson, or designate, of the student’s major department. The advisor is responsible to the department and to the School of Graduate Studies for the supervision of the student’s work.

Faculty Advisory Committee Appointments

Once the advisor has been assigned, the student and the advisor must decide who will make up the Faculty Advisory Committee. Once the committee members have been selected by the advisor and the student, the “Request for New Advisor or Committee Appointment” form must be completed and forwarded to the School of Graduate Studies. The Dean of the School of Graduate Studies must approve the committee appointments.

Financial Information

Assistantship and Award Policies and Procedures

Applications for Graduate Assistantships are accepted throughout the year. Students should contact the department for information.

Deadlines for Scholarships and Fellowships are announced each year. Information and applications are available in the School of Graduate Studies and in the department.

The following policies are applicable to the award and retention of graduate appointments and awards:

1. Students admitted to the School of Graduate Studies and notified that they have been granted an appointment or award before they actually have received a bachelor’s degree may neither register nor hold an appointment or award until they have received the bachelor’s degree and fulfilled all requirements for admission to the School of Graduate Studies as a degree seeking student.

2. Assistantship appointments will not exceed one-half time in all combinations.

3. Students must maintain the credit load requirements defined in the appointment letter to retain appointments or awards. Graduate Assistants must be enrolled in a minimum of six (6) credits. This requirement is waived for students in their final semester with fewer than six credits remaining on their Program of Study. (A School of Graduate Studies petition is required.)

4. Students must maintain a 3.00 GPA (2.75 Master of Engineering) to retain awards or appointments.

5. Students may be removed from an appointment due to unsatisfactory performance.

6. Students in good academic standing, i.e., a GPA of 3.0 or higher are eligible for reappointment.

7. Students who withdraw from or are dismissed from the School of Graduate Studies become immediately ineligible for and may not continue to hold an appointment or award.

Graduate assistantship stipends are subject to income tax and tax will be withheld. Tax will not be withheld from scholarships, traineeships, and fellowships, but the stipend may be taxable. Rulings as to the actual taxability of any specific stipend are in the hands of the Internal Revenue Service.

In accordance with the provisions of federal statutes, it is the policy of the University of North Dakota that no person in the United States shall be discriminated against because of race, creed, handicap color, sex, age, or national origin in the selection for an award or appointment provided only that the applicant meets the eligibility conditions for an award. Policies and procedures affecting graduate assistantships are described more fully in the Graduate Assistant Handbook.
Assistantships

Graduate Teaching Assistantships

Graduate Teaching Assistantships are university appointments that provide financial assistance to students qualified for teaching service in the department in which they take the major part of their graduate work. The purpose of these assistantships is to facilitate students working toward their degree while gaining teaching experience in the field of the degree. Appointments may be for one-fourth or one-half of full-time service. The student must carry a minimum of 6 credits of graduate work each semester (3 credits in a summer session). Graduate Teaching Assistants may be eligible for a tuition waiver. Tuition waivers may be partial or full; the decision to offer a waiver and the amount of the tuition waiver is determined by the individual program. Graduate Teaching Assistantships are available in many departments offering a graduate degree.

Graduate Research Assistantships

Graduate Research Assistantships are university appointments that provide financial assistance to students qualified for research service in the department. The purpose of research assistantships is to provide degree-seeking students with research experience in their academic disciplines while assisting with ongoing research projects. Appointments may be one-fourth or one-half of full-time service. The student must carry a minimum of six credits per semester (3 for summer). Graduate Research Assistants may be eligible for a tuition waiver. Tuition waivers may be partial or full; the decision to offer a waiver and the amount of the tuition waiver is determined by the individual program. Graduate Research Assistantships are available in many departments offering a graduate degree.

Graduate Service Assistantships

Graduate Service Assistantships are available for work in several units on campus, both academic and non-academic. Graduate students are employed half-time or quarter-time for work in a particular service unit. Stipends vary with the time devoted to service work but usually are comparable to the stipends of graduate teaching assistants. Graduate Service Assistants may be eligible for a tuition waiver. Tuition waivers may be partial or full; the decision to offer a waiver and the amount of the tuition waiver is determined by the individual program or unit making the appointment.

School of Graduate Studies Awards

Amy Hui-Mei Chen Hung Fellowship is awarded to a graduate of the National Taiwan Normal University (NTNU) who wishes to pursue doctoral studies at UND. The applicant must intend to return to NTNU upon graduation.

Neil C. MacDonald Memorial Scholarships of $1,000 are awarded on the basis of promise of high academic achievement and in accord with the ideals and purpose of the University of North Dakota to two graduate students, one of whom should be in History.

Summer Doctoral Fellowships of $5,000 plus a waiver of tuition for the summer session are available to doctoral students who have an approved Dissertation Proposal on file in the School of Graduate Studies and plan to work on their dissertation/research full time during the summer. Applications are due early in the Spring semester and will be evaluated on the basis of an application and recommendations from the advisor and the chairperson.

Doctoral Student Conference Travel Support: The School of Graduate Studies provides travel support of up to $500 for Ph.D. student travel to conferences for the purpose of presenting their work. Funds will be provided to Ph.D. students who are the presenting author at a conference and will be provided for only one conference per academic year. Requests for support will be considered once per semester and are made on an individual basis.

Doctoral Student Dissertation Research Support: The School of Graduate Studies provides support of up to $1,500 for Ph.D. student dissertation research. The purpose of this program is to provide funding for operational expenses required for the dissertation research. Allowable expenses include library fees, expendable research supplies, or other direct costs associated with the research. Major equipment purchases, e.g., computers, electronics, etc., are not allowed. Funds for travel to a research site cannot exceed 10% of the total requested amount. Requests for support will be considered once per semester and are made on an individual basis.

Tuition Waivers

Tuition waivers may be available to graduate students, including those students receiving an Assistantship. Tuition waivers may be partial or full; the decision to offer a waiver and the amount of the tuition waiver is determined by the individual program or unit making the appointment.

Students are responsible for all fees assessed to them, including mandatory student fees. Students are responsible for any tuition not covered by the waiver.

Students must register for classes by the last day to add a full term class in order to access their tuition waiver. Failure to register by the last day to add a full-term class may result in forfeiture of the waiver.

The following policy applies to all tuition waiver awards:

- Tuition waivers will be awarded independently of stipends. A student may receive a stipend, a tuition waiver, or both. Graduate Assistants receiving a stipend may or may not receive a waiver.
- Tuition waivers will be awarded in dollar equivalents and may reflect a fraction of total tuition.

Dollar amount waived = credit hours x tuition rate* by residency

*does not include any fees, including mandatory, course, program, or other

- Individual programs will be provided a waiver pool and be responsible for prioritizing and setting the amount of each waiver. Actual allocation to each program is at the individual College or School Dean’s discretion.
- Tuition Waivers do not accumulate or carry over from semester to semester.
- In any given program, a student may not receive tuition waivers for more than the number of credits in their approved Program of Study. Changing a program of study for the purpose of increasing eligibility for tuition waivers is not allowed.
- In any one semester, the maximum dollar value of tuition waived may not exceed the total tuition billed.
- Continuing enrollment (996) and online courses are not eligible for tuition waivers.
- Students will receive an email notification with their tuition waiver offer. The waiver will be applied to the student’s account unless the School of Graduate Studies receives notice that the student would like to decline the offer.

Questions regarding the tuition waiver policy should be emailed to gradschool@UND.edu.

Cultural Diversity Tuition Waivers are awarded by the School of Graduate Studies. These waivers are available to historically under-represented or economically disadvantaged students. Applications are available on the School of Graduate Studies’ website.

Grades

Grading System

A graduate student will be allowed credit for a course only when a grade for the course has been reported to the Office of the Registrar. Grades awarded in all courses are indicative of the quality of the work done. Their significance is as follows:

<table>
<thead>
<tr>
<th>Grade Honor Point Equivalent</th>
<th>Explanation</th>
<th>Grade Pts. Per Sem. Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(Superior)</td>
<td>4 Honor Points</td>
</tr>
<tr>
<td>B</td>
<td>(Excellent)</td>
<td>3 Honor Points</td>
</tr>
</tbody>
</table>
**Graduate Grade Point Average**

A graduate student’s cumulative GPA is based on all coursework, graduate or undergraduate, taken while the student is registered in the UND School of Graduate Studies. Grades of less than “C” are not included in the number of credits accepted for a graduate degree, but they are counted in determining the cumulative GPA.

Credits and grades for courses accepted in transfer, or courses graded on a Satisfactory-Unsatisfactory basis are not counted in determining the GPA.

Courses with grades of Incomplete are neither counted as partial fulfillment of degree requirements nor calculated in the GPA.

**Satisfactory/Unsatisfactory Grading**

Some seminars, research, thesis, dissertation, and field work may be graded on a Satisfactory/Unsatisfactory basis.

Those courses usually are marked in the Schedule of Courses, and the entire registration for the course will be graded on the S/U basis.

The student does not have the option of receiving a grade. Graduate students do not have the option of electing S/U grading in either graduate or undergraduate courses.

**Incomplete Grades**

It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student’s control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark “I,” Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor. Incompletes are entered on the final grade sheet, and instructors must also sign and submit a “Report of Incomplete Grade” form to the Office of the Registrar. The instructor may choose any one of the following options for the deadline to complete the course:

1. The default date as stated in the UND Schedule of Courses.
2. Extend to 12 calendar months after the end of the course.
3. A date of the instructor’s choosing no later than 12 months after the end of the course.

Incomplete grades will convert to a grade of “F” if a grade is not submitted by the instructor to the Office of the Registrar on or before the deadline written on the “Report of Incomplete Grade” form.

The instructor of the course and the Dean of the School of Graduate Studies must approve and sign the Report of Incomplete Grade form for any extension of incomplete beyond the default date listed in the UND Schedule of Courses. It is the student’s responsibility to contact their instructor about an incomplete grade posted on the final grade report.

An “I” may be converted as indicated above but cannot be expunged from the record. Students may not register for courses in which they currently hold grades of incomplete, except for courses that allow repeated enrollment. A student will not be allowed to graduate with an unconverted incomplete grade on the academic record.

**In Progress Grades**

A grade of “SP,” Satisfactory Progress or “UP,” Unsatisfactory Progress may be assigned to Scholarly Project (995), Thesis (998), Dissertation (999), Independent Study (997), Readings for Comprehensive Examination (ENGL 591 Readings for Ph.D. Comprehensive Examinations), Professional Exhibition (ART 599 Professional Exhibition) or Research (leading to the thesis or dissertation). The “SP” or “UP” grade for these activities, which may span several semesters, need not be replaced until the conclusion of the activity, usually a student’s final semester. Grades of “SP” or “UP” are not calculated into term or cumulative GPA values and will be expunged from the record upon submission of final grades for the course.

**Grade Changes**

Submitted grades, except for grades of incomplete, are final and may only be changed to correct an error. Grades may not be changed by additional work or submitting additional materials. Students should report any error to their instructor within 90 days of receipt of the grade. The instructor must file a change of grade form with the Registrar signed by the instructor, the department chair, and the dean of the course (Note: For courses receiving graduate credit, the School of Graduate Studies Dean is the dean of the course). Reasons for the change must be fully explained and justified.

**Repetition of Courses**

All courses taken by graduate students, for which a grade of D, F, or U was received, may be repeated once for credit, with only the second grade to count in the grade point average. This option does not apply to a student who has been dismissed. Courses with grades of C or better may not be repeated without the written approval of the Dean of the School of Graduate Studies. It is up to the student to notify the School of Graduate Studies when a course has been retaken so that the grade point average can be recalculated. Courses taken as an undergraduate may not be taken again as a graduate student and used on a program of study.

**Graduate Cooperative Education**

Some departments offer Graduate Cooperative Education. The course must meet the following minimum requirements set by the Graduate Committee:

- The student must be in Approved status and in good academic standing (minimum 3.00 GPA).
- The student must have completed a minimum of 9 credits of the Program of Study.
- The nature of the Cooperative Experience must be relevant to the student’s approved Program of Study.
- The student must have the approval of the department, i.e., department chair or graduate director, and of his/her advisor before the co-op begins.
- The student must have the approval of the School of Graduate Studies dean prior to beginning the Cooperative Education experience.
- Proper work experience on campus may be acceptable, but not employment in the department granting the co-op credit.
- Credit will not be allowed for current career track positions.
- No more than 20% of the Program of Study will be allowed for co-op credit.
- The student will be required to present a seminar and submit a written report.
- The co-op experience must be compensated.
- Programs allowing cooperative education experiences must include cooperative experiences in their outcomes-based assessment activities.

The Department’s requirements for registration in Graduate Cooperative Education may be more stringent than the minimums set by the School of Graduate Studies.

**Graduate Credit**

Graduate credit may be earned only by students enrolled in the School of Graduate Studies and in courses listed in the Graduate section of the Academic
CANDIDACY FOR DEGREES

Admission to the School of Graduate Studies does not imply admission to candidacy for an advanced degree. The rights to candidacy can be earned only by demonstrating the preparation for and ability to pursue graduate work and by fulfilling requirements prerequisite to candidacy. Those requirements are described in detail for each degree. Advancement to candidacy does imply that the student has been judged by the advisory committee and the dean to have satisfactorily completed much of the formal coursework and examination requirements and to be fully qualified to pursue the remaining, usually more independent, portion of the degree work.

Graduate Credit for Undergraduate Courses

A limited number of upper level undergraduate courses may be approved for graduate credit with approval of the Graduate Committee and University Curriculum Committee. It is understood that the student will be required to do additional work of greater complexity, over and above that typically required for undergraduates.

NOTE: The 300 or 400 level courses listed in this section of the catalog were approved by the Graduate Committee for graduate credit on the basis that the student be required to do additional work, generally of an independent nature.

Graduate Work by Undergraduates

Graduate courses normally are open only to graduate students. An undergraduate senior at UND may enroll in graduate courses (500 level) for undergraduate credit. All undergraduate students must have the permission of the instructor and School of Graduate Studies Dean to take a graduate course. Requests for approval must be submitted on the “Petition for Graduate Credit as an Undergraduate Student,” which is available from the School of Graduate Studies.

Students classified as Seniors may petition the Dean of the School of Graduate Studies requesting permission to enroll in graduate level courses for graduate credit. For this petition to be considered, the following requirements must be met:

1. The graduate credits being petitioned are not needed to complete requirements for the baccalaureate degree.
2. The graduate course(s) are listed in the current School of Graduate Studies Catalog.
3. The petition is filed by the last day to add a full-term course.
4. The student is a senior.
5. The student is within 12 credits of the baccalaureate degree.
6. The student’s load is not more than 16 credits in a regular semester or 8 credits in a summer session.
7. The student’s overall GPA is at least 3.00.
8. The undergraduate degree will be completed at the close of the current semester.
9. The course(s) are not taken for S/U grading.

Graduation-Application for Degree or Diploma

Students who expect to receive a degree must complete the online graduation application by the deadline noted in the academic calendar. All graduate students must have been advanced to candidacy the semester preceding the semester in which they expect to graduate.

After the student applies for the degree, the School of Graduate Studies checks the academic record to ensure that the student is eligible to graduate. A new application must be filed if the student fails to graduate. Students must be registered for the term in which they expect to receive their degree.

Maximum and Minimum Academic Load

A full course load for a graduate student is 9 credit hours in a semester or 6 credits in a summer session. A graduate student may carry no more than 12 credit hours per semester or 12 credits in a summer session without permission of the student’s advisor and the Dean of the School of Graduate Studies. Graduate Assistants must carry at least 6 credits each semester or 3 credits in a summer session.

Maximum Period Allowed and Revalidation of Courses

Maximum Period Allowed for Graduate Programs and Revalidation of Courses

Graduate courses more than seven years old are considered obsolete and may not be counted to fulfill course requirements for an advanced degree program. Programs of study more than seven years old are also obsolete.

Obsolete UND graduate courses may be revalidated and may be counted toward an advanced degree on the recommendation of the student’s Faculty Advisory Committee and with the consent of the Dean of the School of Graduate Studies. In no case will more than one-half of a program of study be accepted for revalidation. Revalidation of an obsolete graduate course can be approved only if it can be demonstrated that a student’s knowledge of the subject matter of the course is current. Oral and/or written examination on the subject matter of the course normally is required. Prior approval of the dean must be obtained for the proposed revalidation on the form titled “Revalidation of UND Graduate Course.” Certain fees may apply.

Graduate work from another institution which is obsolete may not be revalidated for a UND graduate degree. Work which was part of a completed prerequisite graduate degree program does not become obsolete.

Minors and Cognates

Some degree programs require or permit academic work outside of the major field of study, which may be called a minor, (at least nine credit hours), or a cognate, (at least six credit hours). Credit hours earned towards a previously awarded degree or certificate cannot apply to a minor or cognate.

A minor is a concentrated study in a specific supporting field at the graduate level. A minor must be titled and identified on the student’s program of study and be approved by a Graduate Faculty member of the minor department/program. The minor will be listed on the student’s transcript, only if the minor has been approved by the State Board of Higher Education. Only courses approved for graduate credit may be included in a minor. If the student is doing a non-thesis option, the Graduate Director of the minor department must sign and approve the program of study. For students writing a thesis or dissertation, the student's advisor and the Dean of the School of Graduate Studies must approve the program of study. For students writing a thesis or dissertation, the student's advisor and the Dean of the School of Graduate Studies must approve the program of study. For students writing a thesis or dissertation, the student's advisor and the Dean of the School of Graduate Studies must approve the program of study. For students writing a thesis or dissertation, the student’s advisor and the Dean of the School of Graduate Studies must approve the program of study. For students writing a thesis or dissertation, the student’s advisor and the Dean of the School of Graduate Studies must approve the program of study.
one of the student’s advisory committee members must be from the minor department.

A cognate is a selection of courses providing broad support to the major. All courses numbered 300 or above listed in this catalog, including those offered by departments or fields that do not offer graduate courses or graduate degrees, may be included in the cognate. Exceptions may apply to language courses where lower level courses may be allowed to fulfill cognate requirements. (Note: advanced approval of the program and graduate dean is required.) Courses should be taken in two or three departments or fields. A cognate area will not be titled and will not be listed on a student's transcript. Courses from the student's major cannot be used as a cognate area. Students wishing to pursue a cognate must fulfill all degree requirements for their program. Courses that are not approved for graduate credit cannot count towards the degree requirements, but may satisfy the cognate requirements.

NOTE: When a graduate student elects to take a 300 or 400 level course that has been approved for graduate credit or a 300 or 400 level course as part of their cognate, it is understood that the student will be required to do additional work of greater complexity, over and above that typically required of undergraduates. Usually, such work is of an independent nature.

Program of Study

Students must submit a Program of Study for approval by the Dean of the School of Graduate Studies which will have been developed in consultation with the advisor and signed by the departmental chairperson (or designate). If a minor is declared, the Program of Study also must be signed by the chairperson of the minor department. The Program of Study should be developed early in the second semester and submitted to the School of Graduate Studies.

The Program of Study is a listing of the courses and credits needed to meet the requirements for the degree and major (area of concentration). In addition to a major, some students elect to obtain a minor (a concentrated study in a specific supporting field) or to take courses in a cognate area (a selection of courses providing broad support to the major). The courses selected for the major, minor, and/or cognate must be included on the Program of Study. It is the student’s responsibility to know what the course and credit requirements are for their department. The student should consult with their advisor or the Graduate Director of their department when preparing their Program of Study. The Program of Study will include academic coursework in one major department, as well as coursework from related departments, i.e., a minor or cognate. At least one-half of the work must be in the major field. If transfer credits are to be included on the Program of Study, make sure they can be applied to the degree. Transfer courses must be listed on the Program of Study exactly as they appear on the transcript with the exception that quarter credits need to be converted into semester credits. For detailed information, refer to the Transfer of Graduate Credits (p. 357) section in the Graduate Catalog.

Nine graduate non-degree credits may be applied to the degree if they are approved on the program of study. Graduate courses more than seven years old are considered obsolete and may not be included on the program of study. However, obsolete courses may be revalidated by submitting a revalidation plan using the form on the School of Graduate Studies website. A revalidation plan must be submitted to the Dean before the revalidation process is undertaken. The revalidation plan must be attached to the Program of Study for approval if the course(s) are to be applied to the degree.

Courses listed on the Program of Study should be grouped into appropriate sections and supply a title for each one: major, minor, cognate, foundations, etc. The number of required credits should be included in the appropriate column, for the total program, the major, the minor, the cognate, and the foundations areas.

All members of the student’s Advisory Committee must sign the Program of study. Some departments may allow the Program of Study to be submitted prior to selecting a committee. In these cases, only the advisor must sign the Program of Study. Contact the graduate program director with questions about the program’s policy. The graduate program director is also required to sign all Program of Study forms prior to submission to the School of Graduate Studies. Once the Program of Study is approved by the School of Graduate Studies, a copy will be sent to the student and the student’s advisor. Changes to the Program of Study can be made by completing the “Changes to a Program of Study” form found on the School of Graduate Studies Web page. After the advisor signs the form, it should be submitted to the School of Graduate Studies for the Dean’s approval. Do not submit a new program of study, unless there are major changes.

Registration Policies and Procedures

School of Graduate Studies Requirements

Any student who holds a baccalaureate degree and has established status as a Degree, Non-Degree, Certificate student is eligible to enroll in a graduate course, i.e., a course numbered 500 or higher.

Enrollment in certain courses may be limited to degree seeking students in the specific program in which the course is offered. In some instances, students in Non-Degree status may need to seek approval from the department and/or instructor of the course.

Registration and fee payment procedures are outlined by the Office of the Registrar and published in the Schedule of Classes. Registration is complete only upon payment of tuition and fees. Registration may be cancelled by the Business Office if tuition and fees are not paid. Graduate students receiving tuition waivers or other tuition awards should register for classes by the last day to add a full-term class. Failure to do so may result in forfeiture of the tuition waiver or other tuition award. Exemptions to this policy will be granted by the Graduate Dean.

It is strongly recommended that students consult with their advisor before registering for classes. New students are assigned a temporary advisor at the time of admission. Only work taken as a registered graduate student may be credited toward a graduate degree. Approval of the School of Graduate Studies is required and must occur prior to the time that the class is taken. Graduate credit will not be granted retroactively.

The number of credits for which a student may register is subject to certain limits. Registrations not in compliance with University, School of Graduate Studies, and departmental policies are subject to cancellation by the Dean of the School of Graduate Studies.

Research

Research and Scholarship at UND

The faculty at the University of North Dakota are committed to the advancement of knowledge through research and creative scholarship. High quality creative efforts are evidenced by a number of indicators including, but not limited to, publications, presentations, books, performances, exhibitions, and peer reviewed grants and contracts.

In addition to providing stipends and tuition waivers to qualified degree seeking students, the School of Graduate Studies supports research with Summer Doctoral Fellowships, which allow Ph.D. candidates to spend full time on their research, and supports doctoral student conference travel and dissertation research.

The annual School of Graduate Studies Graduate Research Achievement Day (GRAD) features the research and creative scholarship of students and faculty. GRAD is the largest single research event on the UND campus. Detailed information on these and other programs can be found on the School of Graduate Studies (p. 345) website.

The School of Graduate Studies works closely with the Office of the Vice President for Research and Economic Development to provide opportunities for graduate students. The mission of the Office of the Vice President for Research and Economic Development is to serve the broad research community of the University of North Dakota, a community that is instrumental in meeting the strategic aims of the University which are described in the University of North Dakota’s Exceptional UND plan. The aim is to expand and strengthen the University’s commitment to research, scholarship, and creative activity as a means of sustaining and extending the knowledge base, enriching the teaching and learning environment, and enhancing economic development in the community, region, state, nation, and across the world. The hallmark of a major research university is its ability to link faculty across all of the
Office of Sponsored Programs

The Office of Sponsored Programs provides information and assistance on funding sources and guidelines; UND policies on sponsored programs, forms and applications; regulatory policies, such as those for the Institutional Review Board, Animal Use and Care Committee, Institutional Biosafety Committee, and Conflict of Interest; agreements and contracts; and representations and certifications for proposals to Federal programs. Its roles and responsibilities are to assist faculty/staff in locating potential funding sources; to provide information regarding sponsor requirements and proposal preparation; to conduct administrative reviews of proposals; to assure compliance with University and sponsor regulations concerning conflict of interest, export controls, research involving animals, research involving human subjects and misconduct in science or creative activities. The following compliance areas report to the Office of Sponsored Programs.

Grants and Contracts Administration

The mission of Grants & Contracts Administration is to assist faculty and staff with proposal budget preparation, proposal review, award negotiation and financial administration of extramural support according to sponsor regulations. The financial administration of extramural support received by the University for research, service and instructional programs is the responsibility of the Grants and Contracts Administration office. As early as possible in the grant/proposal cycle, a specific grant officer from the Grants & Contracts Administration office staff is assigned to be involved in all aspects of the funding cycle for a particular award, including proposal preparation, award negotiation, monitoring, and reporting. The assignment of a grants officer is made based on the identity of the potential sponsor, i.e., federal, commercial, foundation, and the type of agreement cost reimbursable or fixed price, etc.

Research on Human Subjects

The University of North Dakota Policy and Principles on the Use of Human Subjects requires that any biomedical or behavioral research which involves the use of humans as subjects be reviewed and approved by the Institutional Review Board (IRB) prior to initiation of the project or activity. This policy applies to both faculty and student research. Forms and directions for submission of a project to the Institutional Review Board can be obtained from the Office of Research Development and Compliance. Note: Topic proposals involving human subjects will not be approved without notification of IRB approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Animals

The University of North Dakota requires that any research involving vertebrate animals be reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) prior to initiation of the project or activity. This policy applies to both faculty and student research. Forms and directions for submission of a project to the Institutional Animal Care and Use Committee can be obtained from the Office of Research Development and Compliance. Note: Topic proposals involving vertebrate animals will not be approved without notification of IACUC approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Radiation and Hazardous Materials

The University of North Dakota Radiation Safety and Hazardous Materials Committee functions to ensure compliance with all federal, state, and University regulations and policies for radioactive materials, radiation producing machines, lasers, and hazardous, materials and substances. Research involving such materials must be approved prior to the initiation of the research. Students working with these agents must receive training through the Safety Office or be able to document prior training. Additional information is available through the Office of Research Development and Compliance. Note: Topic proposals involving radioactive and/or hazardous materials will not be approved without notification of Radiation Safety and Hazardous Materials Committee approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Biohazardous Materials

The University of North Dakota Institutional Biosafety Committee (IBC) requires that any research, teaching, or other activities which utilize DNA, recombinant DNA, or involve the use of biohazardous research material be subject to a University Review Process and that these activities must be approved by the IBC prior to their initiation. The IBC is the only authorized University committee which can give approval to projects and activities involving recombinant DNA and biohazardous research material. The IBC will follow the NIH guidelines for recombinant DNA and biohazardous material research in determining the suitability of projects and activities and will provide an explanation of any decision not to approve a project or activity. Any project or activity not approved can be revised and resubmitted to the IBC for consideration. Additional information is available through the Office of Research Development and Compliance. Note: Topic proposals involving recombinant DNA and biohazardous material research will not be approved without notification that the topic has IBC approval. Collection of data may not begin until the topic proposal is approved.

Office of Corporate Engagement and Commercialization

The Corporate Engagement and Commercialization unit is responsible for developing and managing UND research and intellectual property relationships with the commercial sector and supporting the University’s economic development priorities. This includes protection and commercialization of University research innovations including: aerospace sciences including Unmanned Aerial Systems (UAS); computer sciences; medicine and health sciences; and engineering and physical sciences. Corporate Engagement and Commercialization, along with UND General Counsel’s office, will provide protection and commercialization services for UND inventions. Corporate Engagement and Commercialization will define and market technology portfolios of inventions to promote new business ventures and build business alliances to accelerate commercialization of valuable UND research output including transition of inventions to the marketplace. Services include fostering research relationships with commercial partners, performing analysis of patentability, value and marketability to identify strategic direction as a licensing, joint venture or spin-off company opportunity. Corporate Engagement and Commercialization is also a resource for drafting and negotiating legal agreements, such as confidentiality, material transfer, and licensing agreements, with business partners.

Corporate Engagement and Commercialization also works closely with the Technology Accelerator, a faculty for growing technology companies on the west edge of campus. This facility is poised to nurture significant research relationships with UND.

Intellectual Property

The University of North Dakota has detailed policies, derived from the State Board of Higher Education Intellectual Property policy, regarding intellectual property, patents, and copyrights. Students wishing more information about intellectual property rights are referred to the Office of Corporate Engagement and Commercialization and the UND Intellectual Property policy.

Residence Requirements

Some graduate degree programs, especially those with a significant research/ creative component, require that students spend a minimum period of time in residence during their course of study. The purpose of residence is to provide an opportunity for sustained and concentrated intellectual effort, to provide for
immersion in a research environment, and to permit extensive interaction with fellow students and faculty of the major department.

In order to meet a residence requirement, a student must devote full time to academic study and must be registered for at least nine credits in a semester or six credits in a summer session, or be a graduate assistant.

The Residence Requirements are stipulated for each graduate degree program in this catalog. A year of residence requires two consecutive semesters of residence. Two years of residence requires four consecutive semesters of residence or three semesters and two summer sessions, all without interruption.

Any exceptions to the policies stated above must be approved in advance by the student's advisory committee, the student's department, and the Dean of the School of Graduate Studies.

**Thesis/Independent Study/ Scholarly Project or Dissertation**

**Thesis**

The student must submit a thesis to the School of Graduate Studies as partial fulfillment of the requirements for the degree. Credit will be given for the writing of the thesis and for the research completed and incorporated into the thesis. The amount of credit may vary from four to nine credits and will be determined by the major department. The thesis, prepared under the guidance of the student's faculty advisor, must show sound method and demonstrate scholarship. The School of Graduate Studies provides a style manual that may be sued, but the faculty advisory committee may select any appropriate style guide or manual to follow.

The topic for a thesis must be approved by the student's Faculty Advisory Committee. Approval is effected by the student completing a form entitled "Topic Proposal of Thesis," then submitting the proposal to the Advisory Committee and the Dean of the School of Graduate Studies for their approval. The approved proposal is then filed in the School of Graduate Studies to become part of the student's record. The proposal must be approved the semester prior to the semester in which the student expects to graduate, and must be filed in the School of Graduate Studies before a student is advanced to candidacy for a master's degree.

A preliminary draft of the thesis must be presented to the Advisory Committee sufficiently in advance of the preliminary approval deadline that the Advisory Committee may thoroughly evaluate the thesis. After the necessary corrections and changes have been made, the student should secure the committee members' signatures on a form entitled Preliminary Approval of Theses and Dissertations, available on the School of Graduate Studies' website, and file this form in the School of Graduate Studies. The Preliminary Approval, which indicates to the student that no major changes will be required in the final copy of the thesis, must be in the School of Graduate Studies no later than the deadline specified in the Academic Calendar, or the student will not be permitted to graduate that semester.

Copies of the thesis in its final form must be prepared and presented to the student's Faculty Advisory Committee in time that they may thoroughly read the thesis prior to the final examination. When the final version of the thesis has been approved by the Committee, it must be submitted electronically to ProQuest for publication and receive the signed approval of the Dean of the School of Graduate Studies by the deadline announced in the Academic Calendar (usually two weeks prior to commencement).

The final copy of the thesis will be printed and bound by ProQuest and cataloged in the University Library. The student may be required to submit additional copies to the department or faculty committee members.

**Independent Study or Scholarly Project**

The independent study or scholarly project is designed to require the student independently to investigate a topic related to the major field of study. The study need not be an original contribution to knowledge but may be a presentation, analysis, and discussion of information and ideas already in the literature of the field. The requirement is to ensure that a student can investigate a topic and organize a scholarly report on the investigation.

Independent studies are single author works; scholarly projects may be team projects.

The topic for an independent study or scholarly project must be approved by the student’s advisor. Approval is effected by the student completing a form entitled Topic Proposal of Independent Study, available from the School of Graduate Studies and on the School of Graduate Studies website, then submitting the proposal to the advisor for approval. The proposal, must be approved no later than the semester or prior to the one in which the student expects to graduate, and must be filed in the School of Graduate Studies to become part of the record before a student is advanced to candidacy for a master's degree.

Students must prepare and secure the advisor's approval of an independent study or scholarly project report. Copies must be accepted by the advisor who will certify completion by submission of the Final Report on Candidate to the School of Graduate Studies by the deadline specified in the Academic Calendar and submit a grade for 997-Independent Study or 995-Scholarly Project to the Office of the Registrar. The number of copies required will be specified by the department.

**Dissertation**

Each candidate for the Doctoral degree must submit a dissertation to the School of Graduate Studies in partial fulfillment of the requirements for the degree. The dissertation is prepared with the guidance and advice of the student's faculty advisor. The School of Graduate Studies provides a style manual that may be used, but the faculty advisory committee may select any appropriate style guide or manual to follow.

The topic for the dissertation must be approved in advance by the student’s Faculty Advisory Committee. Approval is effected by the student completing a form titled Topic Proposal of Dissertation, available on the School of Graduate Studies website, then submitting the proposal to the committee and to the Dean of the School of Graduate Studies for approval. The approved proposal must be filed in the School of Graduate Studies for approval. The proposal should be approved the semester before the degree is expected, but it must be completed before advancement to candidacy.

The draft of the dissertation should be presented to the Faculty Advisory Committee sufficiently in advance of the Preliminary Approval deadline that a thorough evaluation may be effected by the entire committee. The committee must be able to read the draft, suggest corrections and changes, and the student must be able to make the corrections, all in time for the committee to indicate its approval of the draft by signing a form titled Preliminary Approval of Dissertation. The student must deposit the approval form in the School of Graduate Studies by the deadline specified in the academic calendar (usually four weeks prior to commencement). The Preliminary Approval assures the student that no major changes will be required in the final copy of the dissertation. Copies of the dissertation in its final form must be presented to the Faculty Advisory Committee in time that they may thoroughly read the dissertation prior to the final examination.

When the final version of the dissertation has been approved by the Committee, it must be submitted electronically to ProQuest for publication in time to receive the approval of the Dean of the School of Graduate Studies by the deadline specified in the Academic Calendar (usually two weeks prior to commencement). The final copy of the dissertation will be printed and bound by ProQuest and cataloged in the University Library. The student may be required to submit additional copies to the department or faculty committee members.

**Thesis/Dissertation Defense**

The student's academic advisor must complete the "Notice of Defense" form and secure the necessary signatures. This Notice of Defense along with the Preliminary Approval (if not previously submitted) must be received at the School of Graduate Studies two weeks in advance of your defense. The candidate and committee members must be physically present at the defense unless the program has developed clear guidelines and instructions by which the candidate or committee members may participate at a distance using real-time synchronous technology. Any technology used to facilitate distance participation by the candidate or committee members must be supported by UND, capable of real-time audio and video, compatible with "presentation" software, such as PowerPoint, and must be open and accessible to the candidate, committee and non-committee members.
What is included in the defense varies from department to department. Some departments have students present their dissertation research in a presentation with a question/answer period following. Your advisor should be able to help you prepare. Your examination will be conducted by your Faculty Advisory Committee. It is also open to the other members of the Graduate Faculty and the academic community.

Transfer of Graduate Credits

A limited amount of graduate work completed at a regionally accredited North American institution prior to, or after matriculation in the School of Graduate Studies at UND, may be applied toward a graduate degree at the University of North Dakota. Graduate work is considered for transfer only on an individual basis and only after the student has completed satisfactory work in residence at UND. Those transfer credits approved by the student’s advisory committee and the Dean of the School of Graduate Studies are included in the program of study for the UND graduate degree and only those transfer credits will be recorded on the UND transcript. Students requesting to transfer credits from an international institution will be required to provide a WES credential evaluation.

The basic purpose of the transfer policies is to ensure that transferred work is of comparable content, level, timeliness, and quality to that which would be taken at UND and included on the program of study for the degree. The following policies are generally applicable to the acceptance of the graduate work for transfer to UND:

- The work must have been taken at an accredited North American institution.
- The student must have been enrolled as a Graduate Student.
- The work must have received graduate credit at the institution where it was earned.
- The student must have earned a grade of B or better.
- The work must be less than seven years old at the time the UND degree is awarded with the exception of work that was part of a completed prerequisite degree.
- The amount of transfer credit that will be accepted toward the master’s degree is one-fourth (usually eight semester credits) of the credit hours required for the degree.
- The work credited toward a completed master’s degree may be accepted for a specialist’s diploma or doctoral degree.
- Work beyond the master’s degree must be post-master’s level and from an institution that offers post-master’s degrees in the discipline.
- Work beyond the master’s degree from an institution offering only master’s level work in the discipline may be applied to the minor or cognate areas.
- For the Ph.D., only 30 credits may be transferred beyond the credits allowed for the master’s degree, i.e., a total of 60 credits, if the other institution offers Ph.D. level courses in the same discipline.
- For the Specialist Diploma, only 15 credit hours will be transferred beyond the credits allowed for the master’s degree, i.e., a total of 45 credit hours.
- Courses transferred from another university to a certificate program must meet the conditions of the transfer policy as stated in the “Transfer of Graduate Credits” in the UND Graduate Catalog.

UND Student Health Service Requirements

Required Immunizations

The North Dakota University System (http://www.ndus.edu/makers/procedures/sbhe/default.asp?PID=74&SID=6) policy requires all students to be vaccinated with 2 doses of measles, mumps, and rubella. All newly admitted students ages 21 and younger must provide documentation of a meningitis vaccination given after the 16th birthday. Students are also required to complete the TB (Tuberculosis) Screening Form.

Documentation must be provided by August 1st for Fall Semester, January 1st for Spring Semester, and May 1st for Summer Semester. Failure to comply with the immunization requirements will result in a hold on your account restricting you from registering for the following semester.

Immunization documentation may be submitted via the following options:

Mandatory Immunization and TB screening Forms/Instructions (http://und.edu/health-wellness/student-health/_files/docs/instructions-immunizations-tbform.pdf). This form may be printed off, filled out and returned with the appropriate immunization documentation to Student Health Services, 100 McCannel Hall, Stop 9038, Grand Forks, ND 58202 or faxed to 701-777-4835.

OR:

If you have claimed your UND account, you may access our patient portal at myhealth.und.edu to enter your immunizations and upload immunization information electronically. (Use your UND user name and password to log in)

If you have questions, contact UND Student Health Services at 701.777.4500 or 1.800.CALL.UND, ext. 4500.

Exemptions

- Students who are taking courses off campus, such as on-line, correspondence, etc.
- Immunization contraindicated by medical condition
- Student has had one immunization and agrees to have second immunization within one month
- A student’s beliefs preclude participation in an immunization program

If you have medical or religious reasons for not receiving the required immunizations, please complete the Medical/Conscientious Exemption section of the Mandatory Immunization and TB Screening Form. A physician’s signature is required for a Medical Exemption. PLEASE NOTE: By requesting the exemption to immunization, the student may be excluded from all campus activities, including classes, in the event that the North Dakota Department of Health declares the existence of a measles, mumps, rubella or meningitis outbreak at the University. This exclusion shall remain in effect for such time as determined by the North Dakota Department of Health.

Vaccines

In addition to MMR, there is a comprehensive menu of vaccines available at Student Health Services, almost always at a reduced fee. While some vaccines are part of the basic protocol for general health, others are more specific for other purposes, such as foreign travel.

The following vaccines are available:

- Influenza (flu) shots
- Gardasil (HPV)
- Hepatitis A
- Hepatitis B
- Twinrix (combination of Hepatitis A and B)
- Tetanus/diphtheria (Td)
- Tdap (Tetanus, diphtheria and pertussis)
- Pneumovax (PPV23)
- Mantoux (Tuberculosis test)
- Polio
- Yellow Fever
- Chicken Pox (Varicella)
- Rabies
- Typhoid
- Meningitis (MCV4)*
- Japanese Encephalitis

All vaccinations are done by appointment at Student Health Services.

Withdrawal from the University

A student wishing to withdraw from the University before the end of a semester must begin the withdrawal process by submitting a completed Withdrawal Form to the Office of the Registrar. Failure to do so will result in a grade of F in all classes and no refund of fees. If a student would like to completely withdraw from a degree program, he or she must complete a School of Graduate Studies Withdrawal Form available on the School of Graduate Studies website.
Workshops

Graduate level workshops are short-term organized learning experiences which provide for active, hands-on participation or for concentrated study on a specialized topic. Students register as Continuing Education students and do not have to be formally admitted to the School of Graduate Studies.

Graduate level workshops are offered by the graduate departments under the course number “900-Graduate Workshop.” For each workshop registration, a transcript entry will be made showing the title, credit, and grade for the workshop.

Since graduate level workshops are not designed for the purpose of being a part of a graduate degree program, their credit shall not be applied toward graduate degree requirements.

Degrees and Degree Requirements

Degrees and Degree Requirements (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements)

Doctor of Arts (p. 358)

Doctor of Education (p. 358)

Doctor of Nursing Practice (http://und-public.courseleaf.com/graduateacademicinformation/departmentalcoursesprograms/nursing/doctorofnursingpractice)

Doctor of Philosophy (p. 359)

Doctor of Physical Therapy (p. 361)

Joint JD-MBA (p. 361)

Joint JD-MPA (p. 361)

Joint MD-PhD (p. 361)

Master of Arts and Master of Science (p. 361)

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Doctor of Arts

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Doctor of Education

The Doctor of Education (Ed.D.) degree is awarded in recognition of the completion of academic preparation for professional practice in school teaching fields and in fields preparing school service personnel.

Students should refer to the section of this catalog titled “Departmental Programs” for additional admission, degree, examination, and course requirements unique to each department.

Dissertation

Each candidate for the Doctor of Education degree must submit a dissertation to the School of Graduate Studies in partial fulfillment of the requirements for the degree. The dissertation is prepared with the guidance and advice of the student's faculty advisor. All dissertations must be prepared in accord with the Style and Policy Manual for Theses and Dissertations. Copies are available on the School of Graduate Studies website.

The topic for the dissertation must be approved in advance by the student’s Faculty Advisory Committee. Approval is effected by the student's completing the Topic Proposal form, available on the School of Graduate Studies website, then submitting the proposal to the committee and the Dean of the School of Graduate Studies for approval. The approved proposal must be filed in the School of Graduate Studies for approval. The proposal should be approved the semester before the degree is expected, but it must be completed before advancement to candidacy.

The draft of the dissertation should be presented to the Faculty Advisory Committee sufficiently in advance of the Preliminary Approval deadline so that a thorough evaluation may be effected by the entire committee. The committee must be able to read the draft, suggest corrections and changes, and the student must be able to make the corrections, all in time for the committee to indicate its approval of the draft by signing a form titled Preliminary Approval of Dissertation. The student must deposit the approval form in the School of Graduate Studies by the deadline specified in the academic calendar (usually four weeks prior to commencement). The Preliminary Approval assures the student that no major changes will be required in the final copy of the dissertation. Copies of the dissertation in its final form must be presented to the Faculty Advisory Committee in time that they may thoroughly read the dissertation prior to the final examination. Once a student has received signed preliminary approval and has made all of the corrections from their committee, and before the final copy is submitted, the thesis will need to be checked by the School of Graduate Studies for correct style and format. When the final version of the dissertation has been approved by the Committee, it must be submitted electronically to ProQuest for publication in time to receive the approval of the Dean of the School of Graduate Studies by the deadline specified in the Academic Calendar (usually two weeks prior to commencement). The advisor and the major department must each be presented one copy of the dissertation. The final copy of the dissertation is printed and bound by ProQuest and cataloged in the University Library.

Comprehensive Examination

All students seeking a Doctor of Education degree must take a written comprehensive examination after a substantial portion of the coursework has been completed. At the option of the department, an oral examination may also be given. The content of the examination will be determined by the Graduate Faculty of the departments concerned, and the examination will be given at times announced by the departments. The examination must be extensive and searching and cover in depth the field or fields of knowledge in which the degree is taken. This examination must be completed before advancement to candidacy for the degree but cannot be undertaken until the scholarly tool requirements have been completed. Students must apply for permission to take the comprehensive examination on a form available from the School of Graduate Studies. After checking the record to ensure that the student is eligible for the examination (most of the work completed, Approved status attained, Program of Study approved, scholarly tool requirements completed), the School of Graduate Studies will certify eligibility and will forward an examination report form to the chairperson.
of the student’s Faculty Advisory Committee. The student may not take the examination until such certification has been provided. Comprehensive examinations which are failed may be repeated only with prior approval of the advisory committee, the department, and the dean, but in no event earlier than at the next regularly scheduled offering.

Candidacy for the Degree

A student must fulfill all of the requirements for and be advanced to candidacy prior to the beginning of the semester or summer session in which he/she expects to receive a degree.

Students in Approved status may be advanced to candidacy when the following requirements have been fulfilled:

1. A five-member Faculty Advisory Committee has been appointed. Students should complete the form titled “Request for New Advisor or Committee appointment”. The form requires the signatures of the proposed committee members and the signature of the Graduate Director of the program. Submit the completed form to the Office of Graduate Studies for the final approval of the Dean of the School of Graduate Studies. Four of the committee members represent the major and any minor areas of study. The fifth member, who is the Member-at-Large, is appointed by the Dean of the School of Graduate Studies and, represents the Graduate Faculty. The chairperson of the Committee, who serves as the student’s major and dissertation advisor, must be a Full member of the Graduate Faculty. An associate member may chair a doctoral student’s faculty advisory committee and direct the dissertation research if approved by the Dean of the School of Graduate Studies; a mentor will be appointed. Until the appointment of the committee, the department chairperson, or designate, acts as the student’s temporary advisor, who is appointed upon admission to the program. Teaching and Learning has four-member Faculty Advisory Committees.

2. A Program of Study, outlining the requirements for the degree as developed by the student and the Committee, has been approved by the student, the committee, and the Dean of the School of Graduate Studies. The “Program of Study” form should be approved no later than the beginning of the second semester of study.

3. Departmental examination requirements have been completed.

4. A substantial portion of the coursework for the degree has been completed with a GPA of no less than 3.00 for all work attempted.

5. The scholarly tool requirement has been completed.

6. The comprehensive examination has been successfully completed.

7. The “Topic Proposal” form of your dissertation research has been approved by your committee and the Dean of the School of Graduate Studies. Before the proposal can be approved by the Dean, you must have an approved Program of Study, and IRB approval, if needed.

8. When all the above requirements have been met, the student will be advanced to candidacy. The student and the advisor will be sent a status sheet indicating Advancement to candidacy.

Final Examination/Dissertation Defense

The final examination must be scheduled two weeks in advance of the scheduled date by the committee through the School of Graduate Studies and must be completed and the results reported by the deadline specified in the Academic Calendar. The student’s academic advisor must complete the “Notice of Defense” form and secure the necessary signatures. This Notice of Defense along with the Preliminary Approval (if not previously submitted) must be received at the School of Graduate Studies two weeks in advance of your defense. The candidate and committee members must be present at the defense.

The final examination is conducted by the candidate’s full Faculty Advisory Committee in the presence of the dean of the School of Graduate Studies and such other members of the Graduate Faculty as elect to attend. The final examination will include an oral examination but also may include written portions. The examination will cover the dissertation but need not be limited thereto. Committee members must have had adequate opportunity to examine the final copy prior to the examination, and will indicate their approval by signing the Approval Page of the dissertation and the Final Report on Candidate. Final examinations which are failed may be repeated only with the prior approval of the advisory committee and the dean.

What is included in the defense varies from department to department. Some departments have students present their dissertation research in a presentation with a question/answer period following. Your advisor should be able to help you prepare. Your examination will be conducted by your Faculty Advisory Committee. It is also open to the other members of the Graduate Faculty and the academic community.

A student may only repeat a failed examination with the consent of her/his committee and the Dean of the School of Graduate Studies. The results of the defense must be certified by the committee on a form titled “Final Report on Candidate” by the deadline specified on the Academic Calendar.

A student may pass the Doctoral comprehensive and/or Final Examination with one dissenting vote. The dissenter must submit a written report on his/her decision to the School of Graduate Studies. Four signatures will be accepted on the final copy of the dissertation.

Ed.D. candidates will be required to complete a National Research Council demographic survey form and an agreement with University Microfilms International before graduation.

Doctor of Philosophy

The Doctor of Philosophy (Ph.D.) degree is awarded in recognition of the highest degree of creative scholarship and research in a field of study. The recipient of this degree must have demonstrated proficiency in a broad area of learning and the ability to critically evaluate work in the discipline. The degree is not awarded solely for completing a prescribed number of courses, but for having undertaken and completed independent work in the discipline leading to an original contribution to knowledge.

Admission Requirements

Generally, students may undertake work that will lead to a Doctor of Philosophy degree only after they have received a master’s degree, usually in the same academic discipline, from this or another accredited institution; however, in some disciplines it is possible to be admitted directly to the Ph.D. program. In certain disciplines students who have completed the equivalent of the coursework for the master’s degree may be readmitted to work toward the Ph.D. directly, thereby bypassing the master’s degree (see department section). Each student must have:

1. attained an overall GPA of at least 3.00 for all graduate work,
2. completed the necessary undergraduate preparation,
3. completed any departmental examination(s) or other requirements,
4. presented scores on tests required by the department, and
5. been recommended for doctoral work by the department.

Acceptance of a student for doctoral work on the basis of the above criteria does not imply or guarantee advancement of the student to candidacy for the degree.

Program Requirements

The Ph.D. degree requires the completion of a program of 90 semester credits of graduate work beyond the bachelor’s degree, including acceptable master’s degree work (30 maximum credits), and the submission of an acceptable dissertation. The program will include enrollment in courses and/or seminars which are designed to:

1. advance the student’s knowledge in the discipline,
2. provide competence in the scholarly tools (languages, mathematics, etc.) required for study and research in the discipline, and
3. provide competence in the research methods of the discipline, e.g., courses in bibliography or historiography, a research minor in education, courses dealing with current research topics, etc.

With the approval of the student’s Faculty Advisory Committee, up to one-half of the work beyond the master’s degree may be transferred from another institution. The Program of Study will include work in one major department and should include work in one or more related departments, i.e., either a minor or cognate area, but at least one-half of the work must be in the major field. The credits for the dissertation (typically 6-18 credits), and the
research on which it is based, should comprise a substantial portion of the 90 credits for the degree and should be included in the major part of the program.

Students should refer to the section of this catalog titled “Departmental Programs” for additional admission, degree, examination, and course requirements unique to each department.

**Residence Requirements**

Students should contact the program or the School of Graduate Studies for current residency requirements.

**Scholarly Tools**

Candidates for the Ph.D. degree may have to demonstrate competence in scholarly tools required for study and research in the discipline. Each department offering the Ph.D. degree has specified the nature of these tools (languages, mathematics, statistics, computer programming, etc.). See the “Departmental Programs (p. 372)” section for more information. This requirement must be completed before the student is permitted to take the comprehensive examination for the degree or become a candidate for the degree.

**Foreign Language Exam**

Students required to demonstrate a reading knowledge of a foreign language may do so by one of two procedures: Standardized tests (Graduate Student Foreign Languages Tests - GSFLT) prepared by the Educational Testing Service are available in French, German, Russian, and Spanish and are given by the Counseling Center upon student request. The Languages Department will administer a Reading Test in French, German, Russian, or Spanish. This test is offered three times a year: on Reading and Review day at the end of the fall and spring semesters, and on registration day for the fall semester. Students must sign up for the examination with the department secretary, no later than one week before the examination date. Students may take the examination a maximum of three times at the Languages Department. Students needing to demonstrate a reading knowledge in a language other than those mentioned above should, together with their Advisory Committee, petition the Dean of the School of Graduate Studies for approval of the use of the language and the proposed examination mechanism.

**Dissertation**

A dissertation is required in partial fulfillment of the requirements for the Ph.D. degree. It must represent an original and independent investigation in the major field of study. Through the dissertation, and the research leading to it, each candidate clearly must have made a significant contribution to the advancement of knowledge in the field. Credit is given for the dissertation and for the research on which it is based, the amount being determined in advance by the student’s Faculty Advisory Committee in accord with the limits established by the major department.

A dissertation is prepared with the guidance and advice of the student’s faculty advisor and the Committee. However, all dissertations must be prepared in accord with the Style and Policy Manual for Theses and Dissertations. The “Manual” is available on the School of Graduate Studies website. Any exceptions will require approval of the Dean of the School of Graduate Studies, the students advisor, and the advisory committee members.

The topic for the dissertation must be approved in advance by the student’s Faculty Advisory Committee and the Dean of the School of Graduate Studies. Approval is effected by the student’s completing the Topic Proposal form from the School of Graduate Studies and on the website, then submitting the proposal to the committee for approval. The approved proposal is then submitted to the School of Graduate Studies for the Dean’s approval, and then is filed in the School of Graduate Studies. The proposal should be approved the semester before the degree is expected, but it must be approved before advancement to candidacy.

The draft of the dissertation should be presented to the Faculty Advisory Committee sufficiently in advance of the Preliminary Approval deadline so that a thorough evaluation may be effected by each committee member. The Committee must be able to read the draft, suggest corrections and changes, and the student must be able to make the corrections, in time for the Committee to approve the dissertation and sign a form titled Preliminary Approval of Dissertation. Once a student has received signed preliminary approval and has made all of the corrections from their committee, and before the final copy is submitted, the dissertation will need to be checked by the School of Graduate Studies for correct style and format. The student must deposit the Approval Form in the School of Graduate Studies by the deadline specified in the academic calendar (usually four weeks prior to commencement). Unless this deadline is met, the student will not be permitted to graduate at the upcoming graduation. The Preliminary Approval assures the student that no major changes will be required in the final copy of the dissertation.

Copies of the dissertation in its final form must be presented to the Faculty Advisory Committee in time that they may thoroughly read the dissertation prior to the final examination. When the final version of the dissertation has been approved by the committee, it must be submitted electronically to ProQuest for publication in time to receive the approval of the Dean of the School of Graduate Studies by the deadline specified in the Academic Calendar (usually two weeks prior to graduation). The advisor and the major department must each be presented one copy of the dissertation. The final copy of the dissertation will be printed and bound by ProQuest and cataloged in the University Library.

**Comprehensive Examination**

All students seeking a Doctor of Philosophy degree must take a written comprehensive examination after a substantial portion of the coursework has been completed. At the option of the department, an oral examination may also be given. The content of the examination will be determined by the Graduate Faculty of the departments concerned, and the examination will be given at times announced by the departments. The examination must be extensive and searching and must cover in depth the field or fields of knowledge in which the degree is taken. This examination must be completed before advancement to candidacy but cannot be undertaken until the scholarly tool requirements have been completed. Comprehensive examinations which are failed may be repeated once with the prior approval of the Faculty Advisory Committee, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering.

Students must apply for permission to take the comprehensive examination on a form available at the School of Graduate Studies. After checking the record to ensure that the student is eligible for the examination (most of the work completed, Approved status attained, Program of Study approved, scholarly tool requirements completed), the School of Graduate Studies will certify eligibility and will forward an examination report form to the chairperson of the student’s Faculty Advisory Committee. The student may not take the examination until such certification has been provided.

- In lieu of the comprehensive examination, students in Chemistry will take cumulative examinations which begin in the second semester of School of Graduate Studies.

**Candidate for the Degree**

Advancement to candidacy is granted only after the completion of specified academic requirements and upon the recommendation of the Faculty Advisory Committee. Candidates for a doctoral degree will not be allowed to graduate in the same semester or summer session in which they become a candidate for the degree.

Students in Approved status may be advanced to candidacy when the following requirements have been fulfilled:

1. A five-member Faculty Advisory Committee has been appointed. Students should complete the form titled “Request for New Advisor or Committee appointment”. The form requires the signatures of the proposed committee members and the signature of the Graduate Director of the program. The completed form must be submitted to the Office of School of Graduate Studies for the final approval of the Dean of the School of Graduate Studies. Four of the committee members represent the major and any minor areas of study. The fifth member, who is the Member-at-Large, is appointed by the Dean of the School of Graduate Studies and represents the Graduate Faculty. The chairperson of the Committee, who serves as the student’s major and dissertation advisor, must be a Full member of the Graduate Faculty. An associate member may chair a doctoral student’s faculty advisory committee and direct the dissertation research if approved by the Dean of Graduate Studies.
a mentor will be appointed. Until the appointment of the committee, the department chairperson, or designee, acts as the student’s temporary advisor, who is appointed upon admission to the program. *Teaching and Learning has four-member Faculty Advisory Committees.

2. A Program of Study, outlining the requirements for the degree as developed by the student and the Committee, has been approved by the student, the committee, and the Dean of the School of Graduate Studies. The “Program of Study” form should be approved no later than the beginning of the second semester of study.

3. Departmental examination requirements have been completed.

4. A substantial portion of the coursework for the degree has been completed with a GPA of no less than 3.00 for all work attempted.

5. The scholarly tool requirement has been completed.

6. The comprehensive examination has been successfully completed.

7. The “Topic Proposal” form for the dissertation research has been approved by the committee and the Dean of School of Graduate Studies. Before the proposal can be approved by the Dean, an approved program of study, and IRB approval, if needed, must be submitted for approval by the Dean of the School of Graduate Studies.

8. When all the above requirements have been met, the student will be advanced to candidacy. The student and the advisor will be sent a status sheet indicating Advancement to candidacy.

Final Examination

The final examination must be scheduled two weeks in advance by the Committee through the School of Graduate Studies and must be completed and the results reported by the deadline specified in the Academic Calendar.

The student’s academic advisor must complete the “Notice of Defense” form and secure the necessary signatures. This Notice of Defense along with the Preliminary Approval (if not previously submitted) must be received at the School of Graduate Studies two weeks in advance of your defense. The candidate and committee members must be present at the defense.

The final examination for the doctoral degree is conducted by the candidate’s full Faculty Advisory Committee in the presence of the dean of the School of Graduate Studies and such other members of the Graduate Faculty as elect to attend. The final examination must include an oral examination but also may include written portions. The examination must cover the dissertation but need not be limited thereto. Committee members must have had adequate opportunity to examine the final copy prior to the examination and will indicate their approval by signing the “Approval Page” of the dissertation and the “Final Report on Candidate.” Final examinations which are failed may be repeated once with the prior approval of the Advisory Committee and the Dean.

A student may pass the Doctoral Comprehensive and/or Final Examination with one dissenting vote. The dissenter must submit a written report on his/her decision to the School of Graduate Studies. Four signatures will be accepted on the final copy of the dissertation.

Ph.D. candidates will be required to complete a National Research Council demographic survey form and submit their dissertation with Proquest UMI before graduation.

Doctor of Physical Therapy

(See Physical Therapy (p. 567) under Departmental Programs)

Joint JD-MBA

(See Business Administration (p. 397))

Joint JD-MPA

(See Public Administration (p. 583))

Joint M.D. - Ph.D. Program

Through the cooperation of the School of Graduate Studies and the School of Medicine, students may concurrently pursue the Doctor of Philosophy degree in a medical science field (Anatomy and Cell Biology, Biochemistry and Molecular Biology, Microbiology and Immunology, Pharmacology, Physiology, and Therapeutics) and the Doctor of Medicine degree. The minimum time required to complete the joint program is six years of full-time academic study.

Students interested in the joint M.D.- Ph.D. program should first obtain admission to the School of Medicine and Health Sciences to the M.D. degree program, following the normal application process and meeting the selection criteria. A student admitted to the M.D. program may apply to School of Graduate Studies as soon as he/she has selected a graduate program, which may occur before matriculation in Medical School but not later than the end of the first year of Medical School.

Final admission requirements for the M.D./Ph.D. program include:

1. Satisfactory performance in the first two years of the medical education curriculum with passing scores on all required assessment tools.
2. Successful completion of the USMLE Step 1 examination.
3. Satisfactory scores achieved on General and Subject GRE examination or MCAT scores.
4. All other UND School of Graduate Studies admission requirements listed in the UND Academic Catalog.

If admission to a Ph.D. program is granted, the student should apply to the School of Medicine and Health Sciences Student Performance and Recognition Committee for a “modification of original program” which will allow the student to pursue the M.D. degree and Ph.D. degree concurrently. The student also must request the Office of Student Affairs to certify to the School of Graduate Studies his/her satisfactory completion of the first two years of the M.D. program.

Students are expected to complete the following general requirements for the Ph.D. degree in a medical science field:

1. Performance of original research of a quality suitable for publication in refereed, professional journals.
2. Pass final examination which includes preparation and oral defense of a satisfactory dissertation.
3. Completion of BIMD 513 Seminars in Biomedical Science.
4. A minimum of 90 credit hours, including research and dissertation.
5. Successful completion of a scholarly tool (Note: May be specified by a department.)
6. Completion of the first two years of the medical education curriculum, transferred as 44 credits toward the Ph.D.
7. Passing comprehensive examinations covering the coursework in the major area.

Master of Arts and Master of Science

These degrees are available with a thesis option in most fields. A non-thesis option is available in selected fields.

Thesis Option

Course Requirements: A minimum of 30 semester credits is required in a program of study for the M.A. or M.S. degree in a major field. This includes the credits granted for the thesis and the research leading to the thesis. At least one-half of the credits must be at or above the 500-level. A maximum of eight semester credits may be transferred from another institution. Workshop credits are not accepted on the program of study.

The program may include just the major, the major and a minor, or the major and a cognate area. The major must include 20 credits from the major department, and a minor area must include at least nine credits. A cognate must include at least 6 credits. Students should refer to the section of this catalog entitled “Departmental Programs” for program specific admission, degree examination, and course requirements.

Residence Requirements: Students should contact the program or the School of Graduate Studies for current residency requirements.
Thesis: The student must submit a thesis to the School of Graduate Studies as partial fulfillment of the requirements for the degree. Credit will be given for the writing of the thesis and for the research completed and incorporated into the thesis. The amount of credit may vary from four to nine credits and will be determined by the major department. The thesis, prepared under the guidance of the student's faculty advisor, must show sound method and demonstrate scholarship. All theses must be prepared in accordance with the Style and Policy Manual for Theses and Dissertations. The “Manual” is available on the School of Graduate Studies website.

The topic for a thesis must be approved by the student's Faculty Advisory Committee. Approval is effected by the student's completing a form entitled “Topic Proposal of Thesis,” available with instructions from the School of Graduate Studies, then submitting the proposal to the Advisory Committee and the Dean of the School of Graduate Studies for its approval. The approved proposal is then filed in the School of Graduate Studies to become part of the record. The proposal must be approved the semester prior to the semester in which the student expects to graduate, and must be filed in the School of Graduate Studies before a student is advanced to candidacy for a master's degree.

A preliminary draft of the thesis must be presented to the Advisory Committee sufficiently in advance of the preliminary approval deadline that the Advisory Committee may thoroughly evaluate and correct the thesis. After the necessary corrections and changes have been made, the student should secure the committee members' signatures on a form entitled Preliminary Approval of Theses and Dissertations, available on the School of Graduate Studies' Website, and file this form in the School of Graduate Studies. The Preliminary Approval, which indicates to the student that no major changes will be required in the final copy of the thesis, must be in the School of Graduate Studies no later than the deadline specified in the Academic Calendar, or the student will not be permitted to graduate that semester. Once a student has received a signed preliminary approval and has made all of the corrections from their committee, and before the final copy is submitted, the thesis will need to be checked by the School of Graduate Studies for correct style and format.

Copies of the thesis in its final form must be prepared and presented to the student's Faculty Advisory Committee in time that they may thoroughly read the thesis prior to the final examination. When the final version of the thesis has been approved by the Committee, it must be submitted electronically to ProQuest for publication and receive the signed approval of the Dean of the School of Graduate Studies by the deadline announced in the Academic Calendar (usually two weeks prior to commencement).

The final copy of the thesis will be printed and bound by ProQuest and cataloged in the University Library. The student must submit one copy to the major department and one to the advisor.

Candidacy for the Degree

Admission of a student to the School of Graduate Studies as a Degree Student in Approved status implies only that the student has met the minimal entrance requirements and will be permitted to take graduate courses which normally will lead to a degree. The student has not been admitted as a candidate for a degree. Advancement to candidacy is a formal procedure and can be granted only after the student has met certain academic requirements. To become a candidate for the Master of Arts or Master of Science (thesis options), the following requirements must be met in approximately the following sequence:

1. Completion of 12 graduate credits at UND.
2. A GPA of at least 3.00 for all work attempted.
3. The appointment of a Faculty Advisory Committee. The Faculty Advisory Committee is preliminarily recommended by the dean under the recommendation of the chairperson, or designate, of the student's major department and normally will consist of three members, but may consist of four. The form for Committee appointments is available on the School of Graduate Studies website. If the student intends to include a minor on the program of study, one committee member must be chosen to represent the minor field. The chairperson of the Committee normally must be a Full Member of the Graduate Faculty but may be an Associate Member under certain conditions. The chairperson must represent the student's area of interest, and must serve as the thesis advisor. The Committee is responsible for program advisement, thesis advisement, and examination of the student.

4. Approval of a Program of Study. Until such time as a student selects a thesis advisor, the department chairperson, or designate, will act as a temporary advisor for the selection of courses, etc. After the formation of a Faculty Advisory Committee, the student and the Committee should formulate a Program of Study for the degree on a form available on the School of Graduate Studies website. The program should be developed early in the second semester of enrollment. After the program has been signed by the student and the Committee, it is submitted to the School of Graduate Studies for the approval of the Dean.

5. Approval of a Topic Proposal. A proposal for a thesis research project must be submitted to the student's advisory committee and the Dean of the School of Graduate Studies for approval. The proposal is submitted on a form available on the School of Graduate Studies website. This proposal, when approved by the Faculty Advisory Committee and the Graduate Dean is deposited in the School of Graduate Studies and indicates acceptance of a topic for the thesis research project. The proposal must be filed at the School of Graduate Studies the semester prior to the one in which the student expects to graduate.

Students and their advisors will receive a status sheet when advanced to candidacy. Students must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.

Final Examinations: Students are required to present themselves for a final examination before their final Faculty Advisory Committee. The examination will be written and/or oral and will include defense of the thesis, but also may include other methods of evaluation over the completion of a study for the degree. The "Notice of Defense" form, found on the School of Graduate Studies Web page, must be completed and submitted to the School of Graduate Studies at least one week prior to the final examination. The results must be reported to the School of Graduate Studies, on the Final Report on Candidate form, by the deadline specified in the Academic Calendar. The Committee members must have had an opportunity to examine the final copy of the thesis prior to the examination and will indicate their approval by signing the approval page of the thesis. Final examinations which are failed may be repeated only with the prior approval of the Advisory Committee and the Dean of the School of Graduate Studies.

Non-Thesis Option

The degrees Master of Arts and Master of Science without a thesis are available in selected fields. Except as noted below, the requirements are the same as those listed under the thesis option.

Course Requirements: A minimum of 32 semester credits is required for the degree. This includes 2 credits in the major for an independent study project for which the student registers for the course numbered 997 or 995. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include at least 22 credits from the major department and a minor must include at least nine credits. A cognate must include at least six credits.

Students should refer to the section of this catalog entitled Departmental Programs for additional admission, degree, examination, and course requirements unique to each department.

Residence Requirement. Students should contact the program or the School of Graduate Studies for current residency requirements.

Independent Study or Scholarly Project. The independent study or scholarly project is designed to require the student independently to investigate a topic related to the major field of study. The study need not be an original contribution to knowledge but may be a presentation, analysis, and discussion of information and ideas already in the literature of the field. The requirement is to ensure that a student can investigate a topic and organize a scholarly report on the investigation. Independent studies are single author works; scholarly projects may be team projects.

The topic for an independent study or scholarly project must be approved by the student's advisor. Approval is effected by the student's completing a form entitled Topic Proposal, available on the School of Graduate Studies website, then submitting the proposal to the advisor and Dean of the School of Graduate Studies for approval. The proposal, which must be approved no later than the semester prior to the one in which the student expects to graduate.
must be filed in the School of Graduate Studies to become part of the record before a student is advanced to candidacy for a master’s degree.

Three copies of the report (one each for the student, the advisor, and the department) must be accepted by the advisor who will certify completion by submission of the Final Report on Candidate to the School of Graduate Studies by the deadline specified in the Academic Calendar and submit a grade for 997-Independent Study or 995-Scholarly Project to the Office of the Registrar.

Candidacy for the Degree. The requirements for advancement to candidacy under the non-thesis option are the same as those listed under the thesis option with the following exceptions:

1. Advisor. Students must obtain the appointment of an advisor from the major department. The advisor, must be a member of the Graduate Faculty, and will be appointed by the Dean of the School of Graduate Studies, upon the written recommendation of the chairperson, or designate, of the student’s major department. The advisor is responsible to the department and to the School of Graduate Studies for the supervision of the student’s work.

2. Program of Study. Students must submit a Program of Study for School of Graduate Studies approval which will have been developed in consultation with the advisor and signed by the departmental chairperson (or designate). If a minor is declared, the program also must be signed by the chairperson of the minor department. The Program of Study should be developed early in the second semester and submitted to the School of Graduate Studies.

3. Topic Proposal of Independent Study or Scholarly Project. Students must obtain approval of a topic for the independent study or scholarly project. The advisor approves the Topic Proposal, and the student submits the form to the School of Graduate Studies for approval to become part of the record. The topic proposal must be filed prior to the semester or session in which the student expects to graduate.

Final Examinations. Those advanced to candidacy for non-thesis master’s degrees must pass written final comprehensive examinations covering the major field but may, at the advisor’s discretion, draw upon or cover the supporting areas. Such examinations generally will be given and evaluated by the major department. The results of the final examination will be certified to the School of Graduate Studies by the advisor and the Department Chairperson on the form entitled “Final Report on Candidate” by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) will be arranged by the advisor and administered by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Comprehensive examinations which are failed may be repeated only once with the prior approval of the advisor, the department, and the Dean of the School of Graduate Studies, but in no event earlier than at the next regularly scheduled offering.

Candidates may not take the final comprehensive examination(s) unless they have been advanced to candidacy for the degree, and are in satisfactory academic standing.

Master of Business Administration

(See Business Administration (p. 397) under Departmental Programs)

Master of Education

The Master of Education degree (M.Ed.) is designed for those who wish to prepare for careers as teachers, specialists, administrators, or supervisors in elementary or secondary schools. To be eligible for the degree, a student must meet the undergraduate requirements in Education, i.e., eighteen semester credits in Education, including student teaching, and must be offered admission to the degree program by the Dean of the School of Graduate Studies.

The Master of Education degree is available for those doing major work either within or outside of the College of Education and Human Development. The areas of concentration available are: Educational Administration, Elementary Education, Special Education, and Reading Education. The degree is also available in the Mathematics Department.

Course Requirements. A minimum of 32 semester credits is required for the M.Ed. degree, of which at least one-half must be at or above the 500 level. No less than 12 credits, including 2 for the Independent Study Report (987), must be in a single field or an area of concentration (major). At least 6 credits must be in an area or cognate to the area of concentration. At least 6 credits must be in the Foundations of Education. A total of 16 credits may be taken off-campus.

Residence Requirement. Students should contact the program or the School of Graduate Studies for current residency requirements.

Transfer of Credit. A maximum of eight graduate credits may be transferred from another institution.

Independent Study. The independent study is designed to enable the student independently to investigate a topic related to the major field of study. The study may be a presentation, analysis, or discussion of information and ideas already in the literature of the field. The requirement is designed to ensure that a student can investigate a topic and organize and present a scholarly report on the investigation.

The topic for an independent study must be approved by the student’s advisor and the Dean of the School of Graduate Studies. The independent study proposal must be approved no later than the semester prior to the one in which the student expects to graduate, and must be filed in the School of Graduate Studies before a student is advanced to candidacy for a master’s degree. The student must prepare and secure the advisor’s approval of an independent study report. Three copies of the report (one each for the student, the advisor, and the department) must be accepted by the advisor who will certify completion of the report to the School of Graduate Studies by the deadline specified in the Academic Calendar and submit a grade for 997-Independent Study to the Office of the Registrar.

Candidacy for the Degree. To become a candidate for the Master of Education degree the following requirements must be met in approximately the following sequence:

1. Completion of 12 graduate credits at UND.
2. A GPA of at least 3.00 for all work attempted.
3. Appointment of an advisor from the major department. The advisor, who must be a member of the Graduate Faculty, will be appointed by the Dean of the School of Graduate Studies upon recommendation of the chairperson of the student’s major department. The form for advisor appointment is available on the School of Graduate Studies website. The advisor is responsible to the department and the School of Graduate Studies for the supervision of the student’s work.
4. Approval of a Program of Study on a form available from the School of Graduate Studies website. The Program of Study should be prepared in consultation with the advisor early in the second semester, and must bear the signature of the student, the advisor, and the Graduate Program Director and must be submitted to the Dean of the School of Graduate Studies for approval for the designated deadline.
5. Approval of a topic for the independent study by having the advisor sign the Topic Proposal of Independent Study form and submitting the Proposal to the School of Graduate Studies for the Dean’s signature.

The student and the advisor will be notified in writing of the advancement to candidacy. Students must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.

Final Examinations. Candidates for the Master of Education degree must pass written final comprehensive examinations which must cover the major field but may, at the advisor’s discretion, draw upon or cover the supporting areas. Candidates may not take the final comprehensive examination(s) unless they have been advanced to candidacy for the degree, and are in satisfactory academic standing.

The appropriate comprehensive examination(s) will be arranged for by the advisor and given by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Such examinations generally will be given and evaluated by the major department. The results of the final examination will be certified to the School of Graduate Studies by the advisor and the department chairperson by submitting the Final
Final Examination. Candidates for the Master of Engineering degree must pass written final comprehensive examination(s) which must cover the course material in the field of study. The appropriate comprehensive examination(s) will be arranged by the advisor and given by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Such examinations generally will be given and evaluated by the major department. The results must be certified to the School of Graduate Studies by the advisor, the Graduate Program Director, and the Dean of the Department of Graduate Studies for approval.

Project and submitting the Proposal to the School of Graduate Studies for approval. The advisor is responsible to the department and the School of Graduate Studies for the supervision of the student’s work.

The advisor is responsible to the department and the Dean of the College of Engineering and Mines, and must be submitted to the Dean of the College of Engineering and Mines, and must be signed by the student, the advisor, the Graduate Program Director, and the Dean of the College of Engineering and Mines, and must be submitted to the Dean of the School of Graduate Studies for approval.

Candidacy for the degree. Admission of a student to the School of Graduate Studies as a degree student in Approved status implies only that the student has met minimum entrance requirements and will be permitted to take graduate department courses must be at the 400 level or above and approved for Graduate Credit. No courses numbered below 300 may be included in the program.

Course Requirements. The program of study for the M. Engr. degree must contain at least 30 credits, including at least 15 credits at the 500 level. An engineering design project, registered through your department must be completed for 3-6 credits. A written report on this project is required. All major department courses must be at the 400 level or above and approved for Graduate Credit. No courses numbered below 300 may be included in the program.

Students should refer to the section of this catalog titled “Departmental Programs” for the admission, degree, examination, and course requirements unique to each department.

1. Completion of the equivalent of 12 semester credits.
2. Attainment of a GPA of at least 2.75 for all work attempted.
3. The appointment of an advisor from the major department. The advisor must be a member of the Graduate Faculty and will be appointed by the Dean of the School of Graduate Studies upon the recommendation of the chairperson of the student’s major department and the Dean of the College of Engineering and Mines. The advisor is responsible to the department and the School of Graduate Studies for the supervision of the student’s work.
4. Approval of a Program of Study on a form available from the School of Graduate Studies or from the School of Graduate Studies website. The Program of Study should be developed in consultation with the advisor early in the second semester and must be signed by the student, the advisor, the Graduate Program Director, and the Dean of the College of Engineering and Mines, and must be submitted to the Dean of the School of Graduate Studies for approval.
5. Approval of a topic for the design project by having the advisor, Graduate Program Director, and Dean of Engineering sign the Proposal of Design Project and submitting the Proposal to the School of Graduate Studies for approval. The student and the advisor will be sent a status sheet notifying them of the advancement to candidacy. Students must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.

Final Examination. Candidates for the Master of Engineering degree must pass written final comprehensive examination(s) which must cover the course material in the field of study. The appropriate comprehensive examination(s) will be arranged by the advisor and given by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Such examinations generally will be given and evaluated by the major department. The results must be certified to the School of Graduate Studies by the advisor and the Graduate Program Director on the form Final Report on Candidate by the deadline specified in the Academic Calendar. Comprehensive examinations which are failed may be repeated only with the prior approval of the advisor, the department, and the Dean of the School of Graduate Studies, but in no event earlier than at the next regularly scheduled offering.

Master of Environmental Management

(See Earth System Science and Policy (p. 428) under Departmental Programs)

Master of Fine Arts

(See Art & Design (p. 374) under Departmental Programs)

Master of Music

(See Music (p. 540) under Departmental Programs)

Master of Physician Assistant Studies

(See Physician Assistant Studies (p. 572) under Departmental Programs)

Master of Science in Applied Economics

(See Economics, Applied (p. 432) under Departmental Programs)

Master of Public Administration

(See Public Administration (p. 583) under Departmental Programs)

Master of Social Work

(See Social Work (p. 591) under Departmental Programs)

Specialist Diploma

(See Educational Leadership (p. 434))

Biomedical Engineering

http://engineering.und.edu/bme
bme@engr.und.edu
Faculty: Fazel-Rezai (Program Director), Noghanian, Ruot, and Tavakolian

Degrees Granted: Master of Science (M.S., Thesis-based and Non-Thesis-based) and Doctor of Philosophy (Ph.D.), both via On-Campus and On-Line

The M.S. and Ph.D. programs in Biomedical Engineering (BME) are offered by UND and North Dakota State University (NDSU). The proposed programs would be offered jointly by UND’s College of Engineering and Mines, School of Medicine and Health Sciences, and NDSU’s College of Engineering.

Program Objectives

The objective of the BME program is to establish a jointly-sponsored, interdisciplinary graduate programs to:
• Meet the needs of regional students interested in biomedical engineering.
• Attract women and under-represented minorities into a developing field.
• Educate and train students through courses and research focused on biomedical research and device development.
• Advance the biomedical knowledge base through collaborative research directed by faculty from UND’s School of Medical and Health Sciences, College of Engineering and Mines, and NDSU’s College of Engineering and other qualified researchers from the two universities.

Through biomedical research and device development, develop intellectual property to generate company spin-offs, attract new companies, and subsequent economic development.

Program Structure
Every M.S. or Ph.D. student will be associated with at least one of the following Biomedical Research Groups (BRGs):

- Biomechanics
- Biomaterials
- Bio-instrumentation
- Multi-scale, bio-system simulation and modeling
- Bio-Signals
- Other emerging areas as identified

M.S. program prepares students who have a strong interest in research-oriented engineering related to the medical device field. MS degree will be offered with two options: thesis-based and non-thesis-based. Ph.D. program prepares students who have a strong interest in gaining in-depth knowledge, at the graduate level, in biomedical engineering.

The BME program is currently administered by the Department of Electrical Engineering.

The M.S. and Ph.D. programs in Biomedical Engineering are offered by UND and North Dakota State University (NDSU). The proposed programs would be offered jointly by UND’s College of Engineering and Mines, School of Medicine and Health Sciences, and NDSU’s College of Engineering.

Every M.S. or Ph.D. student will be associated with at least one of the following Biomedical Research Groups (BRGs):

- Biomechanics
- Biomaterials
- Bio-instrumentation
- Multi-scale, bio-system simulation and modeling
- Bio-Signals
- Other emerging areas as identified

Two separate graduate degree programs are offered:

- Master of Science (M.S.) in Biomedical Engineering
- Doctor of Philosophy (Ph.D.) in Biomedical Engineering

The student’s graduate committee for both the M.S. and Ph.D. must consist of at least one faculty member from NDSU.

Master of Science in Biomedical Engineering

Program Requirements
This program prepares students who have a strong interest in research-oriented engineering related to the medical device field. All of the general requirements for enrollment, participation, and completion of a degree documented in the UND Academic Catalog as appropriate shall be required.

The M.S. degree will be offered with two options: 1) thesis-based; and 2) non-thesis-based. Specific requirements over and above the general catalog requirements for both thesis-based and non-thesis-based options are listed below.

Admission Requirements
1. Bachelor of Science degree from an ABET-accredited engineering program; or
2. Students holding a B.S. degree in other disciplines may be admitted to Qualified Status with an obligation to acquire the necessary background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis; and/or
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs; and
4. Minimum GPA of 3.0 (4.0 scale) is required. Conditional admittance may be obtained for GPAs less than 3.0.

Degree Requirements – Thesis-based (total 30 credits)

Required:
Anatomy-Physiology (3-6 credits):
EE 590 Advanced Electrical Engineering Problems (Physiology and Anatomy for Biomedical Engineers) 6
or
Zoo 660 (NDSU - Animal Physiology) 3
Seminar - 3 credits (1 per semester) taken from the following:
EE 570 Seminar 1
ENGR 562 Seminar in Engineering 1
ENGR 790 (NDSU - Seminar) 1
Classes related to BRG (2-3 classes) 6-9
Thesis 9
Electives:
Internship (industrial, clinical or research lab) 0-3
Graduate Preparation, e.g., Grant Writing 0-3
Elective courses approved by advisor 1-9

Degree Requirements – Non Thesis-based (total 30 credits)

Required:
Anatomy-Physiology (3-6 credits from the following):
EE 590 Advanced Electrical Engineering Problems (Anatomy & Physiology for the Biomedical Engineer) 6
or
ZOO 660 (NDSU - Animal Physiology) 3
Seminar (3 credits, 1 per semester) Seminar class can be taken from the following:
ENGR 562 Seminar in Engineering 1
EE 570 Seminar 1
ENGR 790 (NDSU - Seminar) 1
Classes related to BRG (2-3 classes) 6-9
Project 3
Electives:
Internship (industrial, clinical or research lab) 0-3
Graduate Preparation, e.g., Grant Writing 0-3
Electives approved by advisor 1-15

Ph.D. in Biomedical Engineering

Program Requirements
This program prepares students who have a strong interest in gaining in-depth knowledge in biomedical engineering at the graduate level. Specific requirements over and above the general UND Academic Catalog requirements are listed below.
Minimum Admission Requirements

1. Bachelor of Science degree from an ABET-accredited engineering program; or
2. Students holding a B.S. degree in other disciplines may be admitted to Qualified Status with an obligation to acquire the necessary background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis; and/or
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs; and
4. Minimum GPA is 3.0 (4.0 scale) is required. Conditional admittance may be obtained for GPAs less than 3.0.

Degree Requirements (total 90 credits)

| Required: | 
| --- | --- |
| Anatomy-Physiology (3-6 credits) from the following: | 
| EE 590 Advanced Electrical Engineering Problems (Physiology and Anatomy for Biomedical Engineers) 6 | 
| or | 
| Zoo 660 (NDSU - Animal Physiology) 3 | 
| Seminar (3-6 credits, 1 credit per semester) taken from the following: | 
| ENGR 562 Seminar in Engineering 1 | 
| EE 570 Seminar 1 | 
| ENGR 790 (NDSU - Seminar) 1 | 
| Classes related to BRG 12-15 | 
| Dissertation 6-30 | 
| Electives: | 
| Graduate Preparation, e.g., Grant Writing 3-6 | 
| Internship (industrial, clinical or research lab) 3-6 | 
| Electives: | 
| Elective courses (approved by advisor) up to 36 | 

Note: A maximum of 30 credits can be transferred from a M.S. program.

If a student is assigned to more than one BRG, he/she can take courses in those BRGs to satisfy required classes.

The following courses may be considered for the above BRGs:

**Bioinstrumentation BRG**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 539</td>
<td>Electromagnetic Compatibility</td>
<td>3</td>
</tr>
<tr>
<td>EE 456</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>EE 521</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 550</td>
<td>Biomedical Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>ECE 683</td>
<td>NSDU - Instrumentation for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ECE 685</td>
<td>NSDU - Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 796</td>
<td>NSDU - Biomedical Photonics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Biomaterials BRG**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 490</td>
<td>Special Laboratory Problems</td>
<td>1-3</td>
</tr>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHE 593A</td>
<td>Special Topics (Biochemical Engineering)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHEM 665</td>
<td>NSDU - Principles of Physical Chemistry and Biophysics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 685</td>
<td>NSDU - Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 701</td>
<td>NSDU - Quantitative Drug Design</td>
<td>2</td>
</tr>
<tr>
<td>CE 725</td>
<td>NSDU - Introduction to Biomaterials, Materials in Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MN 785</td>
<td>NSDU - Biocompatibility Testing</td>
<td>3</td>
</tr>
<tr>
<td>MN 786</td>
<td>NSDU - Tissue Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

**Biomechanics BRG**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 439</td>
<td>Introduction to Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ME 490</td>
<td>Special Laboratory Problems</td>
<td>1-3</td>
</tr>
<tr>
<td>ME 529</td>
<td>Advanced Finite Element Methods</td>
<td>3</td>
</tr>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 485</td>
<td>NSDU - Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 668</td>
<td>NSDU - Introduction to Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 680</td>
<td>NSDU - Biofluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 743</td>
<td>NSDU - Biomechanics of Impact</td>
<td>3</td>
</tr>
<tr>
<td>ME 755</td>
<td>NSDU - Fluid Mechanics for Bio/Nanotechnologies</td>
<td>3</td>
</tr>
</tbody>
</table>

**Biosignals BRG**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 456</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>EE 508</td>
<td>Intelligent Decision Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 521</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>EE 539</td>
<td>Electromagnetic Compatibility</td>
<td>3</td>
</tr>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 590</td>
<td>Advanced Electrical Engineering Problems (Engineering Computation)</td>
<td>3</td>
</tr>
<tr>
<td>EE 590</td>
<td>Advanced Electrical Engineering Problems (Biomedical Signal Processing)</td>
<td>3</td>
</tr>
<tr>
<td>ECE 685</td>
<td>Biomedical Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

**Multi-Scale System Simulation and Modeling BRG**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 545</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 685</td>
<td>NSDU - Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 687</td>
<td>NSDU - Cardiovascular Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 688</td>
<td>NSDU - Advanced Cardiovascular Engineering II</td>
<td>3</td>
</tr>
</tbody>
</table>

**List of Elective Courses**

In addition to the following list, BRG courses can be considered as elective courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT 500</td>
<td>Principles of Physiology and Pharmacology</td>
<td>6</td>
</tr>
<tr>
<td>PPT 503</td>
<td>Advanced Pharmacology or Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 505</td>
<td>Research Techniques</td>
<td>1-3</td>
</tr>
<tr>
<td>BIMD 510</td>
<td>Basic Biomedical Statistics</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 516</td>
<td>Responsible Conduct of Research</td>
<td>2</td>
</tr>
<tr>
<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</td>
<td>3</td>
</tr>
<tr>
<td>NURS 511</td>
<td>Adv Physiology/Pathophys II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 573</td>
<td>Research Funding</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 673</td>
<td>NSDU - Methods of Biochemical Research</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 716</td>
<td>NSDU - Biochemistry of Proteins and Enzymes</td>
<td>4</td>
</tr>
<tr>
<td>CPM 771</td>
<td>NSDU - Methods of Polymer Characterization</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 685</td>
<td>NSDU - Industrial Biotechnology</td>
<td>2</td>
</tr>
<tr>
<td>PSCI 611</td>
<td>NSDU - Pharmacodynamics and Applied Therapeutics</td>
<td>3</td>
</tr>
<tr>
<td>NURS 702</td>
<td>NSDU - Ethics/Policy</td>
<td>3</td>
</tr>
<tr>
<td>NURS 706</td>
<td>NSDU - Healthcare Delivery Systems, Financing, &amp; Informatics</td>
<td>3</td>
</tr>
<tr>
<td>NURS 714</td>
<td>NSDU - Advanced Pathophysiology I</td>
<td>3</td>
</tr>
<tr>
<td>NURS 716</td>
<td>NSDU - Advanced Pathophysiology II</td>
<td>3</td>
</tr>
<tr>
<td>PHARM 685</td>
<td>NSDU - Economic Outcomes Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

Other classes as deemed appropriate by student’s advisory committee

Master of Science in Biomedical Engineering

Program Requirements

This program prepares students who have a strong interest in research-oriented engineering related to the medical device field. All of the general
requirements for enrollment, participation, and completion of a degree documented in the UND Academic Catalog as appropriate shall be required.

The M.S. degree will be offered with two options: 1) thesis-based; and 2) non-thesis-based. Specific requirements over and above the general catalog requirements for both thesis-based and non-thesis-based options are listed below.

Admission Requirements
1. Bachelor of Science degree from an ABET-accredited engineering program; or
2. Students holding a B.S. degree in other disciplines may be admitted to Qualified Status with an obligation to acquire the necessary background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis; and/or
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs; and
4. Minimum GPA of 3.0 (4.0 scale) is required. Conditional admittance may be obtained for GPAs less than 3.0.

Degree Requirements – Thesis-based (total 30 credits)

Required:
Anatomy-Physiology (3-6 credits):
EE 590 Advanced Electrical Engineering Problems (Physiology and Anatomy for Biomedical Engineers) 6
or
Zoo 660 (NDSU - Animal Physiology) 3
Seminar (3 credits, 1 per semester) taken from the following:
EE 570 Seminar 1
ENGR 562 Seminar in Engineering 1
ENGR 790 (NDSU - Seminar) 1
Classes related to BRG (2-3 classes) 6-9
Thesis 9
Electives:
Internship (industrial, clinical, or research lab) 0-3
Graduate Preparation, e.g., Grant Writing 0-3
Elective courses approved by advisor 1-9

Degree Requirements – Non Thesis-based (total 30 credits)

Required:
Anatomy-Physiology (3-6 credits):
EE 590 Advanced Electrical Engineering Problems (Anatomy and Physiology for Biomedical Engineers) 6
or
Zoo 660 (NDSU - Animal Physiology) 3
Seminar (3 credits, 1 per semester) taken from the following:
EE 570 Seminar 1
ENGR 562 Seminar in Engineering 1
ENGR 790 (NDSU - Seminar) 1
Classes related to BRG (2-3 classes) 6-9
Project 3
Electives:
Internship (industrial, clinical, or research lab) 0-3
Graduate Preparation, e.g., Grant Writing 0-3
Elective courses approved by advisor 1-15

Ph.D. in Biomedical Engineering

Program Requirements
This program prepares students who have a strong interest in gaining in-depth knowledge in biomedical engineering at the graduate level. Specific requirements over and above the general UND Academic Catalog requirements are listed below.

Minimum Admission Requirements
1. Bachelor of Science degree from an ABET-accredited engineering program; or
2. Students holding a B.S. degree in other disciplines may be admitted to Qualified Status with an obligation to acquire the necessary background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis; and/or
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs; and
4. Minimum GPA is 3.0 (4.0 scale) is required. Conditional admittance may be obtained for GPAs less than 3.0.

Degree Requirements (total 90 credits)

Required:
Anatomy-Physiology (3-6 credits):
EE 590 Advanced Electrical Engineering Problems (Physiology and Anatomy for Biomedical Engineers) 6
or
Zoo 660 (NDSU - Animal Physiology) 3
Seminar (3 credits, 1 credit per semester) taken from the following:
ENGR 562 Seminar in Engineering 1
EE 570 Seminar 1
ENGR 790 (NDSU - Seminar) 1
Classes related to BRG 12-15
Dissertation 12-15
Graduate preparation, e.g., Grant Writing 3-6
Internship (industrial, clinical or research lab) 3-6
Electives:
Elective courses (approved by advisory committee) 1-36

Note: A maximum of 30 credits can be transferred from a M.S. program.

If a student is assigned to more than one BRG, he/she can take courses in those BRGs to satisfy required classes.

The following courses may be considered for the above BRGs:

Bioinstrumentation BRG
EE 539 Electromagnetic Compatibility 3
EE 456 Digital Image Processing 3
EE 521 Digital Signal Processing 3
EE 545 Introduction to Biomedical Engineering 3
EE 550 Biomedical Instrumentation 3
ECE 683 (NDSU - Instrumentation for Engineers) 3
ECE 796 (NDSU - Biomedical Photonics) 3

Biomaterials BRG
ME 490 Special Laboratory Problems 1-3
CH 593A Special Topics (Biomedical Engineering) 1-3
CHEM 665 (NDSU - Principles of Physical Chemistry and Biophysics) 3
ECE 685 (NDSU - Biomedical Engineering) 3
ECE 701 (NDSU - Quantitative Drug Design) 2
CE 725 (NDSU - Introduction to Biomaterials, Materials in Biomedical Engineering) 3
MN 785 (NDSU - Biocompatibility Testing) 3
MN 786 (NDSU - Tissue Engineering) 3
Special Laboratory Problems (NDSU - Biochemistry of Proteins and Enzymes)

Electromagnetic Compatibility (NDSU - Industrial Biotechnology)

Introduction to Biomedical Engineering

Research Funding

Intelligent Decision Systems (NDSU - Ethics/Policy)

Advanced Electrical Engineering Problems (Biomedical Engineering)

Basic Biomedical Statistics (NDSU - Introduction to Biomechanics)

Advanced Pharmacology or Physiology (NDSU - Advanced Pathophysiology I)

Multi-Scale System Simulation and Modeling BRG

ECE 485 (NDSU - Biomedical Engineering)

EE 590 (NDSU - Advanced Electrical Engineering Problems (Engineering Computation))

EE 685 (NDSU - Biomedical Engineering)

List of Elective Courses:

In addition to the following list, BRG courses can be considered as elective courses.

PPT 500 Principles of Physiology and Pharmacology

PPT 503 Advanced Pharmacology or Physiology

PPT 505 Research Techniques

BIMD 510 Basic Biomedical Statistics

BIMD 516 Responsible Conduct of Research

NURS 510 Adv Physiology/Pathophysiology I

NURS 511 Adv Physiology/Pathophys II

NURS 573 Research Funding

BIOC 673 (NDSU - Methods of Biochemical Research)

BIOC 716 (NDSU - Biochemistry of Proteins and Enzymes)

CPM 771 (NDSU - Methods of Polymer Characterization)

CHEM 685 (NDSU - Industrial Biotechnology)

PSCI 611 (NDSU - Pharmacodynamics and Applied Therapeutics)

NURS 702 (NDSU - Ethics/Policy)

NURS 706 (NDSU - Healthcare Delivery Systems, Financing, & Informatics)

NURS 714 (NDSU - Advanced Pathophysiology I)

NURS 716 (NDSU - Advanced Pathophysiology II)

PHARM 685 (NDSU - Economic Outcomes Assessment)

Other classes as deemed appropriate by student’s advisory committee

Research

Research and Scholarship at UND

The faculty at the University of North Dakota are committed to the advancement of knowledge through research and creative scholarship. High quality creative efforts are evidenced by a number of indicators including, but not limited to, publications, presentations, books, performances, exhibitions, and peer reviewed grants and contracts.

In addition to providing stipends and tuition waivers to qualified degree seeking students, the School of Graduate Studies supports research with Summer Doctoral Fellowships, which allow Ph.D. candidates to spend full time on their research, and supports doctoral student conference travel and dissertation research.

The annual School of Graduate Studies Graduate Research Achievement Day (GRAD) features the research and creative scholarship of students and faculty. GRAD is the largest single research event on the UND campus. Detailed information on these and other programs can be found on the School of Graduate Studies (p. 345) website.

The School of Graduate Studies works closely with the Office of the Vice President for Research and Economic Development to provide opportunities for graduate students. The mission of the Office of the Vice President for Research and Economic Development is to serve the broad research community of the University of North Dakota, a community that is instrumental in meeting the strategic aims of the University which are described in the University of North Dakota’s Exceptional UND plan. The aim is to expand and strengthen the University’s commitment to research, scholarship, and creative activity as a means of sustaining and extending the knowledge base, enriching the teaching and learning environment, and enhancing economic development in the community, region, state, nation, and across the world. The hallmark of a major research university is its ability to link faculty across all of the institution’s disciplines toward the creation of new ideas and the generation of new technologies. The Office of the Vice President for Research and Economic Development, along with the four research administrative units described below, take a variety of steps designed to create and sustain an environment where faculty and students representing varying disciplines can collaborate in the search for solutions to the world’s major problems. To this end, UND research administration develops resources, both human and technical, to enhance research and creative productivity; disseminates information about research and research opportunities; funds research and creative activities by faculty and graduate students; formulates and administers various policies concerning research to ensure that projects conform both to federal and state guidelines and to the intellectual and academic objectives of the University; stimulates private sector relationships leading to commercial development of the products of the university research enterprise; and manages the intellectual property of the University. The following units report directly to the Vice President for Research and Economic Development.

Office of Sponsored Programs

The Office of Sponsored Programs provides information and assistance on funding sources and guidelines; UND policies on sponsored programs, forms and applications; regulatory policies, such as those for the Institutional Review Board, Animal Use and Care Committee, Institutional Biosafety Committee, and Conflict of Interest; agreements and contracts; and representations and certifications for proposals to Federal programs. Its roles and responsibilities are to assist faculty/staff in locating potential funding sources; to provide information regarding sponsor requirements and proposal preparation; to conduct administrative reviews of proposals; to assure compliance with University and sponsor regulations concerning conflict of interest, export controls, research involving animals, research involving human subjects and misconduct in science or creative activities. The following compliance areas report to the Office of Sponsored Programs.

Grants and Contracts Administration

The mission of Grants & Contracts Administration is to assist faculty and staff with proposal budget preparation, proposal review, award negotiation and financial administration of extramural support according to sponsor regulations. The financial administration of extramural support received by the University for research, service and instructional programs is the responsibility of the Grants and Contracts Administration office. As early as possible in the grant/proposal cycle, a specific grant officer from the Grants & Contracts Administration office staff is assigned to be involved in all aspects of the funding cycle for a particular award, including proposal preparation, award negotiation, monitoring, and reporting. The assignment of a grants officer is based on the identity of the potential sponsor, i.e., federal, commercial, foundation, and the type of agreement cost reimbursable or fixed price, etc.
Research on Human Subjects

The University of North Dakota Policy and Principles on the Use of Human Subjects requires that any biomedical or behavioral research which involves the use of humans as subjects be reviewed and approved by the Institutional Review Board (IRB) prior to initiation of the project or activity. This policy applies to both faculty and student research. Forms and directions for submission of a project to the Institutional Review Board can be obtained from the Office of Research Development and Compliance. Note: Topic proposals involving human subjects will not be approved without notification of IRB approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Animals

The University of North Dakota requires that any research involving vertebrate animals be reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) prior to initiation of the project or activity. This policy applies to both faculty and student research. Forms and directions for submission of a project to the Institutional Animal Care and Use Committee can be obtained from the Office of Research Development and Compliance. Note: Topic proposals involving vertebrate animals will not be approved without notification of IACUC approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Radiation and Hazardous Materials

The University of North Dakota Radiation Safety and Hazardous Materials Committee functions to ensure compliance with all federal, state, and University regulations and policies for radioactive materials, radiation producing machines, lasers, and hazardous, materials and substances. Research involving such materials must be approved prior to the initiation of the research. Students working with these agents must receive training through the Safety Office or be able to document prior training. Additional information is available through the Office of Research Development and Compliance. Note: Topic proposals involving radioactive and/or hazardous materials will not be approved without notification of Radiation Safety and Hazardous Materials Committee approval. Collection of data may not begin until the topic proposal is approved.

Research Involving Biohazardous Materials

The University of North Dakota Institutional Biosafety Committee (IBC) requires that any research, teaching, or other activities which utilize DNA, recombinant DNA, or involve the use of biohazardous research material be subject to a University Review Process and that these activities must be approved by the IBC prior to their initiation. The IBC is the only authorized University committee which can give approval to projects and activities involving recombinant DNA and biohazardous research material. The IBC will follow the NIH guidelines for recombinant DNA and biohazardous material research in determining the suitability of projects and activities and will provide an explanation of any decision not to approve a project or activity. Any project or activity not approved can be revised and resubmitted to the IBC for consideration. Additional information is available through the Office of Research Development and Compliance. Note: Topic proposals involving recombinant DNA and biohazardous material research will not be approved without notification that the topic has IBC approval. Collection of data may not begin until the topic proposal is approved.

Office of Corporate Engagement and Commercialization

The Corporate Engagement and Commercialization unit is responsible for developing and managing UND research and intellectual property relationships with the commercial sector and supporting the University’s economic development priorities. This includes protection and commercialization of University research innovations including; aerospace sciences including Unmanned Aerial Systems (UAS); computer sciences; medicine and health sciences; and engineering and physical sciences. Corporate Engagement and Commercialization, along with UND General Counsel’s office, will provide services to draft, file and prosecute patent applications for UND inventions. Corporate Engagement and Commercialization will define and market technology portfolios of inventions to promote new business ventures and build business alliances to accelerate commercialization of valuable UND research output including transition of inventions to the marketplace. Services include fostering research relationships with commercial partners, performing analysis of patentability, value and marketability to identify strategic direction as a licensing, joint venture or spin-off company opportunity. Corporate Engagement and Commercialization is also a resource for drafting and negotiating legal agreements, such as confidentiality, material transfer, and licensing agreements, with business partners.

Corporate Engagement and Commercialization also works closely with the Technology Accelerator, a facility for growing technology companies on the west edge of campus. This facility is poised to nurture significant research relationships with UND.

Intellectual Property

The University of North Dakota has detailed policies, derived from the State Board of Higher Education Intellectual Property policy, regarding intellectual property, patents, and copyrights. Students wishing more information about intellectual property rights are referred to the Office of Corporate Engagement and Commercialization and the UND Intellectual Property policy.

Academic Grievance

Guidelines for Graduate Student Grievance Hearings, University of North Dakota

The Graduate Committee hears grievances brought by graduate students seeking redress on academic decisions made by the Graduate Dean. This document sets out the procedures for the consideration and hearing of student grievances.

I. PRINCIPLES UNDERLYING STUDENT GRIEVANCE HEARINGS

1. The procedures should be fair and transparent;
2. Student grievances should be dealt with within a reasonable time, decisions should not be rushed, and all information relevant to reaching a fair decision should be taken into consideration;
3. A grievant may be accompanied by an advisor, who may be a lawyer, when appearing at any grievance hearing;
4. The principle parties should have equal access to relevant information and documentation;
5. An individual’s privacy and confidentiality should be respected, subject to the need for an open and fair investigation.
6. Procedures should ensure that, where a grievance is upheld, the matter is handled as quickly as possible;
7. Members of a student grievance hearing panel should disclose any professional or personal relationship they may have with any of the parties;
8. Members of a student grievance hearing panel should excuse themselves if they have a conflict of interest and/or may have difficulty objectively reviewing the facts and information presented.

II. SCHOOL OF GRADUATE STUDIES STUDENT GRIEVANCE DOMAIN AND PROCEDURES

1. The Graduate Committee will review written student grievances concerning academic decisions made by the Graduate Dean.
2. The Graduate Committee does not review the substance of grievances of course grades, allegations of academic dishonesty or scientific misconduct, matters relating to employment or assistantships, or allegations of discrimination. If it has been determined by the relevant administrators or committees that situations such as these have occurred, the Graduate Committee may review whether actions of the Graduate Dean were made on sufficient grounds.
   a. Grade grievances are subject to review by the College in which the course is offered.
   b. Allegations of academic dishonesty, scientific misconduct, and discrimination are subject to review by the College in which the academic dishonesty, scientific misconduct, or discrimination is said to have taken place.
3. Definitions:
   a. “Graduate Dean” refers to the Dean of the School of Graduate Studies or his or her designee.

b. “Day” means normal university school day when regular classes or examinations are held, not including Saturday and Sunday.

c. A Graduate Student Grievance Hearing Panel may be convened during the summer if all the parties are available, and sufficient members of a Graduate Student Grievance Hearing Panel can be available.

d. “Grievance Hearing” is the formal meeting in which the student and other principle parties present information regarding the grievance, and the course of events that led to the filing of the grievance.

e. “Grievance Hearing Panel,” hereby known as the Panel, is the group of Graduate Committee faculty and student designee who are chosen to be present at a grievance hearing.

f. “Grievant” is the student filing the grievance.

4. A Panel consists of the Chair or Vice Chair of the Graduate Committee acting as non-voting Chair of the Panel, four voting members of the Graduate Committee and one voting graduate student (normally the Graduate Committee student member). Each Student Grievance Hearing will be heard by a separate Panel appointed by the Graduate Committee Chair. When establishing Panels, the Graduate Committee Chair will consider the expertise and experience of the members, their familiarity with student grievance hearings, the breadth of background they bring to the Panel, and the potential for perceived conflicts of interest. In the process of setting Panels, Panel members should indicate if they have any potential conflicts of interest. In the event that the Chair of the Graduate Committee is associated with the grievant’s department, or in some other way has a conflict of interest, delegation of Panel members will fall to the Vice Chair of the Graduate Committee. The grievant and the Graduate Dean may each disqualify, for any reason, up to two of the Graduate Committee members from serving on the Panel.

III. FILING A GRIEVANCE

1. A student who disputes an academic decision should first discuss his or her concerns with the Dean of the School of Graduate Studies.

2. The student must file seven copies of a Request for Grievance Hearing (see section III. D, below) stating the grounds and argumentation in support of a grievance to the Chair of the Graduate Committee, not to exceed 10 double-spaced pages excluding attachments. The Chair of the Graduate Committee will review the request to make certain it grieves an action of the Graduate Dean. Grievances that are not within the jurisdiction of the Graduate Committee will be dismissed and returned to the student.

3. A grievance hearing is not a rehearing of the case. The following shall be allowed as grounds for grievance:

   a. Action of the Graduate Dean not being commensurate with the problem being addressed.

   b. Decisions contrary to the weight of evidence.

4. Seven written copies of the Request for Grievance Hearing must be submitted to the Chair of the Graduate Committee no later than 20 days after receiving notification of the action that the student is seeking to be overturned or changed. The request should identify:

   a. The disputed academic decision (within the jurisdiction of the Graduate Committee);

   b. The person that made the decision;

   c. The date the decision was made;

   d. All efforts made to resolve the dispute informally and formally;

   e. Information directly relevant to the Panel’s review of the grievance;

   f. Relevant witnesses or individuals whom the grievant may call during the hearing;

   g. Any other relevant pertinent evidence or documents;

   h. The desired outcome the student is seeking as a result of a grievance hearing.

5. The Graduate Committee chair will notify the student in writing of his or her decision regarding the Request for Grievance Hearing within 5 days of receiving the request. If the Graduate Committee chair approves the Request for Grievance Hearing, the student will receive a list of prospective members of the Panel with the letter notifying them of the chair’s decision. The Recording Secretary will also send the Request for Grievance Hearing and supporting information to the Dean of the School of Graduate Studies within 5 days of the approval decision.

6. Within 10 days of receiving notice of the grievance from the Recording Secretary, the Graduate Dean will provide six copies of a written response (and supporting documents) to the Graduate Committee Chair and one copy to the grievant. The response may not exceed 10 double-spaced pages (including attachments). The request should identify:

   a. Issues raised by the grievant;

   b. All efforts made to resolve the dispute informally and formally;

   c. Information directly relevant to the Panel’s review of the grievance;

   d. Relevant witnesses or individuals whom the Graduate Dean may call during the hearing;

   e. Any other relevant pertinent evidence or documents; and

   f. The desired outcome the Graduate Dean is seeking as a result of a grievance hearing.

IV. INITIAL REVIEW OF GRIEVANCES

Within 10 days of receiving the Graduate Dean’s response, the Chair of the Graduate Committee will appoint a Panel, as outlined above and communicate the names of the Panel members to the grievant and the Graduate Dean. The grievant and the Graduate Dean must inform the Chair of the Graduate Committee within 5 days if he/she wishes to disqualify any prospective Panel members. Once the Panel has been established, a date for the hearing will be set. The Chair of the Panel will send notice of the hearing to the student and the Graduate Dean. The notice will include the date, time, location and procedures of the hearing. The Chair of the Panel may invite others to provide information at the hearing. The grievance hearing will be normally scheduled within 10 days of the Graduate Dean’s written response to the filed grievance.

V. MEDIATION

At any time the parties may consider mediation of outstanding issues. None of the parties or the Graduate Committee will conduct the mediation. All applicable timelines remain in effect, unless extended by the Chair of the Graduate Committee.

VI. GRIEVANCE HEARING

1. If either party intends to submit supplemental materials (six copies) to the Panel for consideration, he/she must also provide hard copies to the other parties to the hearing. All copies must be provided at least 5 days prior to the scheduled hearing. These materials may not exceed 10 double-spaced pages excluding attachments. Failure to provide copies in time may result in the materials not being considered by the Panel.

2. Hearings will be conducted in a manner conducive to ascertaining the facts of the case. Parties to the grievance will be provided an opportunity to:

   a. Be present and hear all arguments and oral statements made to the Panel during the hearing;

   b. Make arguments, present oral statements and written documents, and call witnesses with regard to issues of fact relevant to the grounds for grievance; and

   c. Ask questions of other witnesses, either directly or through the Chair (to be determined by the Chair).

3. Each party may be accompanied at the hearing by an advisor, who may be a lawyer. The advisors are not allowed to address the Panel, question witnesses, or take an active Graduate Academic Information role in the proceedings. The advisor is simply there to provide advice to a party. The Graduate Dean will not bring a lawyer unless the grievant indicates he/she intends to bring a lawyer. If the grievant intends to bring a lawyer, he/she should notify the Graduate Dean and the Chair of the Graduate Committee 5 days prior to the start of the hearing.

4. At any time, the Chair of the Panel may consult an advisor or a lawyer, call witnesses, or ascertain information deemed relevant to the grievance. The Chair of the Panel is authorized to request the appearance of additional witnesses or the submission of additional information necessary to clarify an already introduced issue. The Panel may address questions to any person participating in the hearing.

5. The Panel may establish time limitations for the oral presentations of the parties. As a regular order of business, each party will have 30 minutes for presentation, inclusive of time allocated to allowing witnesses to speak. It is recommended that long statements by witnesses be presented in written form as attachments to the original grievance or response.

6. The formal rules of evidence do not apply to Grievance Hearings. All information not repetitious or irrelevant may be admitted, subject to guidelines of time and length.
7. No witness will be allowed to attend the hearing before he or she testifies or until he or she has been released.
8. Hearings will be closed to the public unless the student wishes them to be open. If the hearings are open, great care must be exercised by all who speak to protect the privacy of others who are not parties to the proceedings.
9. In hearings involving a single incident with more than one student, a single hearing may be scheduled for all of the students. If the Chair determines that it would be in the best interest of individuals involved, separate hearings may be provided. When collective hearings are held, individual findings, decisions, and recommendations will be rendered. Students who do not file a grievance will not automatically benefit from a grievance filed by another student.
10. The hearing will be recorded. Both parties may access the recording, after the final report is issued, by contacting the Recording Secretary of the Graduate Committee.
11. The Chair may require someone to leave the hearing whose conduct or presence may impede the hearing process.
12. All documents, recordings and findings will be subject to the university’s records retention policy.

VII. ORDER OF PROCEEDINGS IN A GRIEVANCE HEARING
1. The Chair will begin the hearing with a brief opening statement. The Chair will then ask each person in the room to introduce himself or herself for the record. The Chair will state the reason for the hearing, describe the role of the Panel and explain the procedures to be followed. The Chair will ask the student filing the grievance whether he or she wishes the hearing to be open or closed. If the student requests a closed hearing, only the Recording Secretary, the principle parties, the Panel and, if applicable, their advisors shall remain. Witnesses will only be allowed in the room when they are presenting, but may be asked to remain available to answer additional questions later in the proceedings.
2. Following the Chair’s summary, and unless otherwise determined by the Chair of the Panel, the order of presentation will be:
   a. Grievant presents case, including witnesses and other evidence (30 minutes). Members of the Panel may ask brief questions to clarify a point, but in general the student should be allowed to present without interruption. Witnesses must exit after providing their information, and should not be allowed to speak with each other until released. They should be available for questions later;
   b. Graduate Dean presents case, including witnesses and other evidence (30 minutes). Members of the Panel may ask brief questions to clarify a point, but in general the Graduate Dean should be allowed to present without interruption. Witnesses must exit after providing their information, and should not be allowed to speak with each other until released. They should be available for questions later;
   c. Panel members question either party and witnesses. Determination of the order of questions, requesting the presence of witnesses, and managing the dialog during the hearing is done at the discretion of the Chair in consultation with other members of the Panel;
   d. Summary by the Graduate Dean (5 minutes);
   e. Summary by the Student (5 minutes);
   f. Declaration by the Chair that the hearing is concluded.

VIII. FINDINGS, DECISIONS, AND RECOMMENDATIONS OF THE PANEL
1. Upon completion of the hearing, the Panel will meet in closed session for deliberations. If the student requests an open hearing, then deliberations will also be open. If the process requires more time than originally scheduled, the Panel may suspend its discussion and reconvene at an agreed upon later date and time. A simple majority vote of the Panel is required for all findings, decisions, and recommendations.
2. If, in the course of deliberations, the Panel determines it would like to obtain additional information from either party, or from any other individual that the Panel feels could provide useful information, the Chair of the Panel will reopen the hearing at a mutually convenient time for all parties.
3. The Panel Chair will prepare a written final decision, to include:
   a. A statement addressing the subject of the grievance;
   b. A decision that indicates whether the grievance is upheld, denied, or if a modified solution to the situation is recommended;
   c. (Optional) recommendations, if appropriate, for further actions by University authorities.
4. All members of the Panel sign the Decisions, Findings, and Recommendations document.
5. The Panel will provide the grievant and the Graduate Dean with a copy of the decision of the Panel within 10 days from the date of the conclusion of the hearing.

IX. SUBSEQUENT HEARINGS
1. The Panel acts on behalf of the Graduate Committee. The student may grieve the decision of the Panel to the Student Academic Standards Committee.
Graduate Programs and Courses

The following graduate degree and certificate programs are offered through the UND School of Graduate Studies. Updates to this list may be found on the UND School of Graduate Studies website.

- Accountancy (p. 372)
- Admissions Policies and Procedures (p. 346)
- Aerospace Sciences (p. 374)
- Anatomy and Cell Biology (p. 374)
- Art and Design Visual Arts (p. 374)
- Arts and Sciences (p. 376)
- Atmospheric Sciences (p. 377)
- Aviation (p. 379)
- Biochemistry and Molecular Biology (p. 386)
- Biology (p. 386)
- Biomedical Sciences (p. 391)
- Business Administration (p. 397)
- Chemistry (p. 403)
- Clinical Translational Science (p. 407)
- Communication Sciences and Disorders (p. 413)
- Communication (p. 410)
- Computer Science (p. 415)
- Counseling Psychology and Community Services (p. 420)
- Criminal Justice (p. 426)
- Degrees and Degree Requirements (p. 358)
- Earth System Science and Policy (p. 428)
- Economics (Applied) (p. 432)
- Education (p. 434)
  - Curriculum and Instruction (p. 459)
  - Early Childhood Education (p. 460)
  - Educational Foundations and Research (p. 447)
  - Educational Leadership (p. 450)
  - Elementary Education (p. 461)
  - English Language Learners (TESOL) (p. 463)
  - Higher Education (p. 464)
  - Instructional Design and Technology (p. 467)
  - Reading Education (p. 471)
  - Special Education (p. 472)
  - Teaching and Learning (p. 455)
- Engineering (p. 481)
  - Biomedical Engineering (p. 364)
  - Chemical Engineering (p. 484)
  - Civil Engineering (p. 486)
  - Electrical Engineering (p. 491)
  - Energy Systems Engineering (p. 495)
  - Environmental Engineering (p. 497)
  - Geological Engineering (p. 500)
  - Mechanical Engineering (p. 504)
  - Petroleum Engineering (p. 508)
- English Language and Literature (p. 510)
- Geography and Geographic Information Science (p. 514)
- Graduate Program Summaries (http://und-public.courseleaf.com/graduateacademicinformation/departmentalcoursesprograms/graduateprogramsummaries)
- Harold Hamm School of Geology and Geological Engineering (Geol and GeoE) (p. 517)
- History (p. 523)
- Kinesiology and Public Health Education (p. 527)
- Linguistics (p. 529)
- Mathematics (p. 532)
- Medical Laboratory Science (p. 535)
- Microbiology and Immunology (p. 537)
- Music (p. 540)
- Nursing (p. 545)
  - Adult-Gerontology Primary Care Nurse Practitioner (p. 554)
  - Advanced Public Health Nurse (p. 554)
  - Doctor of Nursing Practice (p. 555)
  - Doctor of Philosophy (p. 556)
  - Family Nurse Practitioner (p. 552)
  - Nurse Anesthesia (p. 551)
  - Nurse Educator (p. 551)
  - Post-Master's Certificate in Nursing (p. 555)
  - Psychiatric Mental Health Nursing Nurse Practitioner (p. 553)
- Nutrition and Dietetics (p. 557)
- Occupational Therapy (p. 559)
- Pharmacology, Physiology and Therapeutics (p. 564)
- Physical Education (p. 567)
- Physical Therapy (p. 567)
- Physician Assistant Studies (p. 572)
- Physics and Astrophysics (p. 575)
- Psychology (p. 578)
- Public Administration (p. 583)
- Public Health (p. 587)
- Social Work (p. 591)
- Sociology (p. 594)
- Space Studies (p. 596)
- Speech-Language Pathology (p. 603)
- Theatre Arts (p. 603)
- University Courses (p. 604)

Accountancy

The Master of Accountancy is approved to accept students to begin graduate study in an updated program in the Fall of 2018. For current information regarding admission, curriculum, and other matters related to the program, please see the department's website and/or contact the Department of Accountancy at 701.777.2921.

http://business.und.edu/undergraduate/accounting/

FACULTY: Byars, Campbell, De Magalhaes, Dosch, Ellingson, Li, Mocadlo, Notbohm

Degree Granted: Master of Accountancy (MAcc)

The Master of Accountancy (MAcc) degree is a professional graduate degree for individuals with an accounting background seeking advanced study in the discipline of accounting and broader aspects of business. Specifically, the primary goal of the MAcc is to assist in the preparation of professional accountants. Three supporting objectives of the Program are:

1. To assist students in dealing with unstructured problems and complex decision making in accounting and business environments;
2. To assist students in improving their communications skills in a professional setting; and
3. For those who choose to pursue the CPA designation as part of their professional development, assist in their preparation for the CPA examination.

The Program is intended to fulfill expectations of the public accounting profession by providing a graduate option to fulfilling the 150-hour requirement currently in effect in most public accounting jurisdictions, including North Dakota and Minnesota. The MAcc also serves those planning to pursue careers in corporations, private companies, government and nonprofit organizations.
Master of Accountancy (MAcc)

Admission Requirements

Admission to Approved status requires:

1. Applicant must adhere to the UND School of Graduate Studies standards for admission.
2. Completion of the Graduate Management Admission Test (GMAT) with a score that equals or exceeds an overall score of 500. In certain circumstances, applicants may substitute the GRE or LSAT for the GMAT.
3. An overall grade point average of at least 3.00 in the undergraduate degree program (based on a 4.00 scale), or a 3.25 GPA, or equivalent, for the last two years.
4. Command of the MAcc foundation (see description below).

Applicants who meet the first three requirements listed above, but who have not met the coursework requirements of the MAcc foundation, may be admitted to Qualified Status.

Applicants who fail to meet the minimum grade point or GMAT requirements, but who otherwise show high potential for success may be considered for admission to Provisional Status with the approval of the Program Director and the Department Chair.

Combined Admission

Individuals at UND currently completing their junior year (90 credits) towards an accounting undergraduate degree may apply to the MAcc under combined admission. Combined admission to the MAcc program may be granted to accounting students with a minimum of 90 credits completed and both an overall grade point average of 3.25 (based on a 4.00 scale) and 3.25 GPA average for all courses taken with an accounting prefix completed to the date of application and admission. The GMAT score requirements for combined students are the same as that required for other MAcc students.

Combined admission allows students to more effectively manage their course load. By taking a combination of undergraduate and graduate courses, the student can effectively take a larger course load than by taking only graduate courses. Under combined admission, the applicant will be exempted from in his/her undergraduate program. The MAcc program under combined admission will require a minimum of two years of study.

Individuals being admitted to the MAcc under combined admission are considered graduate students, and are eligible for privileges accorded graduate students. Individuals entering the MAcc under combined admission also receive their undergraduate and graduate degrees in the semester when they complete the requirements of both degrees.

The MAcc Foundation

Applicants must demonstrate command of a core undergraduate curriculum in accounting and business. Command may be demonstrated by the successful completion of the foundation coursework with a 3.0 average GPA (based on a 4 point scale), for all foundation courses completed or attempted, and at a grade of ‘C’ or better in each individual foundation course completed. The following courses are required, or may be waived by the MAcc Program Director.

<table>
<thead>
<tr>
<th>Business</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Elements or Principles of Accounting</td>
<td>6</td>
</tr>
<tr>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Marketing</td>
<td>3</td>
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<tr>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Finance</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Accounting</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Intermediate Accounting</td>
<td>6</td>
</tr>
<tr>
<td>Cost/Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Accounting Systems</td>
<td>3</td>
</tr>
<tr>
<td>Tax</td>
<td>3</td>
</tr>
<tr>
<td>Auditing</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 36

Degree Requirements

The MAcc degree is an accounting program including graduate courses in most of the functional areas of the accounting discipline. The MAcc Program Director is responsible for coordinating all aspects of the program. The MAcc degree program course requirements are:

1. A minimum of 32 semester credits of academic work must be completed. The GPA for all courses listed on the Program of Study must be an average of 3.00 or higher. The Program includes 20 semester credits of required coursework, including the ACCT 997 Independent Study (2 credits), and sufficient electives to total 32 semester credits. The required courses are:

   2. ACCT 501 Seminar in Financial Accounting 3
   3. ACCT 504 Seminar in Auditing 3
   4. ACCT 508 Fraud Examination 3
   5. ACCT 509 Accounting Information for Decision and Control 3
   6. FIN 501 Managerial Finance 3
   7. ISBC 517 Advanced Accounting Systems 3
   8. ACCT 997 Independent Study 2

Total Credits 20

3. Twelve credits of elective courses are required. At least six credits of these electives must be at the 500 level. Other courses may be substituted by approval of the MAcc Director. Those 300- and 400-level courses taken for graduate credit must be approved for graduate credit by the Graduate Committee, and have a graduate level component included to be considered part of the Program of Study.

4. All MAcc students will be required to complete (receive a passing score) a comprehensive final examination, covering the MAcc core curriculum, excluding ACCT 997 Independent Study. The comprehensive final exam must be taken during the semester the student is graduating. The comprehensive final exam will be offered each semester, including summer session. The timing of the comprehensive final will be determined and announced to all MAcc candidates within the first four weeks of each semester. Students will be allowed two attempts to pass the comprehensive final examination. The second attempt will normally be at the next regularly scheduled comprehensive final, but may be at an alternate time established by the Program Director.

Students who have already completed courses similar to those in the MAcc curriculum may be required to choose substitutes from graduate credit offerings listed in the catalog. Substitutions require prior approval of the MAcc Director and the Graduate Dean.

Students can measure progress towards completion of the degree by attaining the following criteria:

1. Maintain and complete the degree with a 3.00 or greater cumulative GPA.
2. Satisfactory progress towards completion of 32 credit hours contained in the Program of Study.
4. Satisfactorily complete the Comprehensive Final Examination.

Courses

ACCT 501. Seminar in Financial Accounting. 3 Credits.
Addresses current issues in financial accounting and develops appropriate professional judgment by understanding theory, concepts, and issues underlying the financial accounting and reporting process.

ACCT 502. Financial Reporting and Decision Making. 3 Credits.
This course provides an overview of financial accounting terminology and concepts, financial statements, and the financial reporting process. Emphasis is placed on the decision usefulness of financial statement information and the financial reporting process as a means of communicating information about firms. Prerequisite: Successful completion of Ivy Software’s “Business Math and Statistics-Graduate” self-paced course or demonstrated equivalent competencies, F.S.

ACCT 504. Seminar in Auditing. 3 Credits.
Expands understanding of the auditing function and provides a framework for analyzing contemporary auditing and assurance issues. Prerequisite: Satisfactory evidence of academic training or practical experience.
ACCT 507. Advanced Managerial Accounting. 3 Credits.
Functional uses of accounting in management of the enterprise.

ACCT 508. Fraud Examination. 3 Credits.
Focuses on understanding types of fraud as well as collecting and evaluating evidence relating to preventing and detecting frauds. Evidence gathering methods will include the examination of documents, publicly available information, and standard practices for interviews and interrogations. Prerequisite: ACCT 405 or equivalent.

ACCT 509. Accounting Information for Decision and Control. 3 Credits.
Management accounting concepts and their application in internal planning, control, and decision-making. Prerequisite: ACCT 502. F,S.

ACCT 575. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of nine credits with permission of department. Prerequisite: Permission of department. Repeatable to 9 credits.

ACCT 590. Contemporary Readings in Accounting. 2 Credits.
Review of outstanding monographs and other writings in the field of accounting.

ACCT 591. Accounting Research. 1-6 Credits.
Individual student projects designed to develop skills in accounting research.

ACCT 592. Research in Federal Tax. 1-4 Credits.
Research in Federal Income Tax with emphasis on corporations and shareholders. Prerequisite: ACCT 411 or equivalent. Repeatable to 4 credits.

ACCT 593. Research in Business Law. 1-4 Credits.
Individual projects designed to develop basic skills in legal research.

ACCT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ACCT 997. Independent Study. 2 Credits.
The independent study requires the student to investigate a topic in accounting and to prepare a formal report satisfactory to the MAcc Program Director.

ACCT 998. Thesis. 1-15 Credits.

Undergraduate Courses for Graduate Credit

ACCT 309. Accounting Information Systems. 3 Credits.
The application of systems design and use from the accountant's perspective. Coverage includes computerized and manual accounting systems, elements of internal control, flowcharting, and the interface of accounting and management information systems. Prerequisites: ACCT 301 and Junior or Senior Standing; declared CoBPA majors only. F,S.

ACCT 312. Fund Accounting. 3 Credits.
Financial accounting, control, and reporting for governmental and not-for profit entities. Prerequisites: ACCT 201 and ACCT 218; Junior or Senior Standing; declared CoBPA majors only. F,S.

ACCT 401. Advanced Accounting. 3 Credits.
Special problems in accounting including consolidated statements, partnerships, and foreign exchange. Prerequisites: ACCT 302; Junior or Senior Standing; declared CoBPA majors only. F,S.

ACCT 403. Contemporary Accounting Theory. 3 Credits.
A study of the emerging issues and the problems facing the accounting profession with special emphasis on the authoritative pronouncements as designated by the American Institute of CPAs and the Financial Accounting Standards Board. S-U grading not allowed. Prerequisite or Corequisite: ACCT 401 or consent of instructor; declared CoBPA majors only. F,S.

ACCT 405. Assurance Services. 3 Credits.
Explores methods of improving the quality of information or its context for decision makers. Examples include assurances on the reliability of financial statements, the processes and controls used to manage and operate businesses, assertions and agreements made to third parties, and regulatory compliance. Prerequisites: ACCT 302, ACCT 309, ECON 210; Junior or Senior Standing; declared CoBPA majors only. F,S.

ACCT 406. Independent Assurance. 3 Credits.
Auditing and assurance theory as applied by independent accountants. Prerequisites: ACCT 405 or consent of instructor; declared CoBPA majors only. S.

ACCT 410. Federal Individual Income Tax. 3 Credits.
Federal income tax relating to individuals to include the more complex tax situations. A computerized individual income tax preparation is used as a part of the course. Prerequisites: ACCT 201; Junior or Senior Standing; declared CoBPA majors only. F,S.

ACCT 411. Business Income Taxation. 3 Credits.
Federal income tax relating to corporations and partnerships. Introduction to estate and gift tax and fiduciary income tax. Prerequisites: ACCT 302; Senior Standing; declared CoBPA majors only. F,S.

ACCT 416. Advanced Business Law. 3 Credits.
Advanced topics and contemporary issues in business law including ethics, legal representation in business, and the impact of selected governmental regulations on businesses. Prerequisites: ACCT 315 and Senior Standing; declared CoBPA majors only. F,S.

Aerospace Sciences

(See Aviation (p. 380) or Space Studies (p. 596): Aerospace Sciences Ph.D. program)

Anatomy and Cell Biology

The Anatomy & Cell Biology program is no longer accepting applications.

http://und-public.coursesleaf.com/graduateacademicinformation/departmentalcoursesprograms/biomedicalsiences/

The four graduate programs (Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, and Pharmacology, Physiology & Therapeutics) at the University of North Dakota School of Medicine and Health Sciences are now combined into an integrated, multi-disciplinary program in Biomedical Sciences. Students that entered the programs in fall 2014 will follow the newly developed curriculum and will become a part of the Biomedical Sciences graduate program. Students who enrolled in the four programs previous to fall 2014 will have the option of either completing degree requirements for the program in which they enrolled (found in previous UND Academic Catalogs) or transferring to and completing degree requirements for the Biomedical Sciences graduate program.

Art and Design Visual Arts

http://www.und.edu/dept/art/

FACULTY: Gonzalez-Smith, Hebert, Jones, Lubner (Graduate Program Director), Smith, Yang, and Widmer (Chair)

Degree Granted: Master of Fine Arts (M.F.A.)

The Master of Fine Arts degree program in Visual Arts is a strongly studio-oriented professional preparation in the major emphasis areas of ceramics, drawing, metal smithing, painting, printmaking, sculpture, and mixed media art. Within and outside the visual arts areas there are many opportunities for balanced study in art history, graphic design, photo and supporting disciplines.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Fine Arts (M.F.A.) Mission Statement and Program Goals

The mission of the Department of Art and Design’s graduate M.F.A. program is to provide quality educational experiences to the students that promote critical thinking and creative visual skills based upon the history of art, contemporary trends and theories, and technical skills in the fine art disciplines. Graduates will be prepared to be active artist/researchers who are engaged in a dialogue, which critically examines the larger culture of which the visual arts play an integral role. Graduates will be prepared to enter the professional art world as self-directed practitioners/artists, educators, or occupations in art museums and
galleries. These goals are accomplished through a curriculum that includes hands-on studio experience and academic seminars as a vehicle for the investigation into visual expression.

Goal 1: Students will refine technical skills, with materials, techniques, and equipment specific to the production of their visual art.

Goal 2: Students will refine oral and written skills as a means to communicate the conceptual basis of their visual research and to demonstrate their knowledge and understanding of the cultural, theoretical, and rhetorical issues in the history of art.

Goal 3: Students will develop skills to refine their critical thinking and the conceptual basis for their art work and contextualize their work within the history of art and/or contemporary trends and theories.

Goal 4: Students hone professional skills as artists needed to promote their creative research and to advance within their chosen careers.

Master of Fine Arts (M.F.A.)

Admission Requirements

Applicants who are seeking admission to the School of Graduate Studies must meet all of the minimum general School of Graduate Studies admission requirements as published in the graduate catalog. In addition, the prospective students must fulfill the requirements for admission to the graduate program in Visual Arts.

1. Admission to Approved Status requires a BA or BFA degree with at least 63 semester hours in studio courses plus a minimum of 12 semester hours in art history from a regionally accredited college or equivalent.

2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).

3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

4. Image portfolio of twenty (20) clearly identified images representative of the student’s recent work and/or documentation in cd/dvd format. Images should be submitted at 72 dpi with the longest side not to exceed 1280 pixels in length. The work samples should be submitted to the Department of Art and Design’s Graduate Committee and accompanied by a list containing the viewing sequence, titles, date of completion, dimension (duration), and media.

5. Artist Statement supporting the image portfolio or other documentative application information in cd/dvd format.

6. For students who have earned graduate credit in art or hold an MA degree, a maximum of 15 credits may be accepted towards the MFA degree. Of those 15 credits, up to 6 credits in Art History may be accepted towards the 9-credit art history requirement.

The graduate program in visual arts operates on a rolling admissions basis. Applicants are advised to apply by March 1 for fall admission or October 1 for spring admission. Acceptance as well as financial support is considered pending availability of resources.

Degree Requirements

Students seeking the Master of Fine Arts degree at the University of North Dakota must satisfy all general degree requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Art and Design.

1. The program consists of 60 credits in the following areas:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Emphasis Area (Ceramics, Painting, Drawing, Metallsmithing, Printmaking, Mixed Media, or Sculpture)</td>
<td>30</td>
</tr>
<tr>
<td>Art History and Theory (See #6 under Admission Requirements)</td>
<td>9</td>
</tr>
<tr>
<td>Electives (including at least 12 credits in art)</td>
<td>18</td>
</tr>
<tr>
<td>Professional Exhibition</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

3. At least one-half of the credits must be at or above the 500-level.

4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

5. A critique of each MFA candidate’s work will be conducted by the entire faculty at the end of their first and second semesters in the program. MFA candidates in subsequent years of the program are expected to attend and participate.

6. After the formation of the candidate’s graduate committee two formal reviews of the MFA candidate’s work will be conducted. See candidacy for degree requirements.

7. Prerequisites to graduation include:
   a. Preparation and presentation of a Professional Exhibition, which will be a formal presentation of creative work.
   b. Supplementary exhibition materials including artist’s statement and exhibition announcements.
   c. An image portfolio and/or documentation in cd/dvd format of the Professional Exhibition must be submitted to the Department of Art and Design for its permanent files. Images should be submitted at 72 dpi with the longest side not to exceed 1280 pixels in length.

Residence Requirement

The MFA degree requires at least two semesters, or one semester and two summer sessions taken within a three-year period, in residence.

Professional Exhibition and Artist Lecture

All MFA candidates are required to register for ART 599 Professional Exhibition (three credits). The intention is to give candidates a summary experience as they near the end of their formal training, which will serve as a benchmark in their career development. The presentation and format of the catalog may vary with what the candidate and committee deem appropriate and complimentary to the work to be presented in the exhibition. The artist’s statement may include such things as a critical statement on the candidate’s work, its development, its cultural, philosophical and historical context, and/or reference to the artist’s procedures and techniques. The candidate will present an Artist Lecture that will be open to the public. The candidate’s graduate thesis committee will then examine and evaluate the student’s performance in the Professional Exhibition and Artist Lecture, and report the results to the School of Graduate Studies on the form titled “Final Report on Candidate” by the deadline specified in the academic calendar. The advisor and department chairperson will certify receipt of a copy of the Exhibition Catalog and an image portfolio of the Exhibition.

M.F.A. Candidate Recommended Timetable for Completion of Program

While the program is normally completed in three years, it is possible to achieve the degree in two years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Fall Semester</td>
<td>Full Faculty Critique</td>
</tr>
<tr>
<td></td>
<td>Spring Semester</td>
<td>Full Critique</td>
</tr>
<tr>
<td>Second Year</td>
<td>Fall Semester</td>
<td>Form Thesis Committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Committee Review</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn in Program of Study to School of Graduate Studies for approval</td>
</tr>
<tr>
<td>Third Year</td>
<td>Fall Semester</td>
<td>Second Committee Review</td>
</tr>
<tr>
<td></td>
<td>Spring Semester</td>
<td>ART 599: Professional Exhibition and Artist Lecture</td>
</tr>
</tbody>
</table>

Candidacy for the Degree

Admission of a student to the School of Graduate Studies as a degree student in Approved Status implies only that the student has met the minimum entrance requirements and will be permitted to take graduate courses that normally may be expected to lead to a degree. The student has not been admitted as a candidate for a degree. Advancement to candidacy is granted only after...
the completion of specific requirements and upon the recommendation of the faculty advisory committee. Candidates for the MFA degree will not be permitted to graduate in the same semester or summer session in which they are advanced to candidacy.

Students in Approved Status may be advanced to candidacy for a MFA degree when they have satisfied the following requirements in approximately the following sequence:

1. Completion of the first comprehensive review by the candidate's graduate thesis committee. During the course of study, all MFA students will be evaluated twice and recommendations will be made regarding continuation in the degree program. The first review, held near the end of the second semester or the beginning of the third, is conducted by a graduate thesis committee of three members from the Graduate Faculty of the Department of Art and Design. After formal review of the student's work, the committee prepares a written summary of the results of the evaluation and a recommendation regarding the continuance of the student. A copy of the evaluation is sent to the School of Graduate Studies.

2. Program of Study should normally be approved no later than the beginning of the third semester of enrollment.

3. Completion of a substantial portion of the course work for the degree with an overall GPA of no less than 3.00.

4. Completion of the second committee review prior to the end of the semester preceding the semester in which the student expects to graduate (normally the third or the beginning of the fourth semester in residence). The evaluation will be conducted by the student's graduate thesis committee and will consist of a review of the student's progress toward completion of degree requirements, and a review of plans for the professional exhibition and Artist Lecture. The results of the evaluation will be filed with the School of Graduate Studies and will include a recommendation regarding advancement to candidacy for the MFA degree.

5. Recommendation to the Dean of the School of Graduate Studies for advancement to candidacy by the graduate thesis committee.

Final Evaluation

The graduate thesis committee will examine and evaluate the student's performance in the Professional Exhibition and Artist Lecture, and report the results to the School of Graduate Studies on the form titled "Final Report on Candidate" by the deadline specified in the Academic Calendar. The advisor and department chairperson will certify receipt of a copy of the Exhibition Catalog and an image portfolio and/or documentation in cd/dvd format of the Exhibition.

Courses

ART 501. Sculpture. 1-6 Credits.
Extensive work and study in three dimensional form, media, and methods. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 510. Art History: Issues in Contemporary Art. 3 Credits.
Examines issues in contemporary art relevant to practicing artists. Addresses current intellectual debates around the work of contemporary artists and issues relevant to artists working in a regional setting. Examines the institutional context of contemporary art practice, such as exhibitions venues and funding for professional artists.

ART 520. Painting. 1-6 Credits.
Individual research and experimentation in painting. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 530. Drawing. 1-6 Credits.
Experimentation and elaboration to drawing skills and techniques, both innovative and traditional. Emphasis on individual exploration. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 537. Graduate Cooperative Education. 1-4 Credits.
An elective opportunity in the VA graduate program toward the MFA to participate in an apprenticeship experience in one's selected field of concentration. Prerequisites: Graduate standing and approval of departmental advisor/coordinator.

ART 540. Printmaking. 1-6 Credits.
Individual research and experimentation in printmaking. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 550. Ceramics. 1-6 Credits.
Individual instruction and experimentation in Ceramics. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 560. Metalsmithing: Jewelry and Small Sculpture. 1-6 Credits.
Exploration of historical, traditional, and innovative jewelry and small sculpture techniques using non-ferrous metals, gems, and other materials. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 570. Mixed Media. 1-6 Credits.
Individual instruction and experimentation in mixed media. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 573. Time based Media Arts. 1-6 Credits.
Individual research and experimentation in time-based and media art practice through video, animation, media installation, performance, and/or interdisciplinary art. Repeatable to 30 credits. Prerequisite: Permission of instructor. Repeatable to 30 credits.

ART 581. Workshop. 1-6 Credits.
Prerequisite: Permission of instructor. Repeatable to 12 credits.

ART 590. Individual Research. 1-9 Credits.
Research and creative experiences within a specific area of interest in the Visual Arts and emphasis on refinements of aesthetic applications of techniques and media. Repeatable to twenty-two credits. Prerequisite: Permission of instructor. Repeatable to 22 credits.

ART 599. Professional Exhibition. 3 Credits.
Artist statement, preparation, design, installation, and catalog of solo show. Prerequisite: Permission of student's graduate committee.

ART 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

Undergraduate Courses for Graduate Credit

ART 410. History of Art: Selected Topics. 1-4 Credits.
Study of varied topics in the history of art and architecture. May be repeated as title changes. Repeatable. F,S,SS.

ART 413. History of Graphic Design. 3 Credits.
Study of the political, cultural, aesthetic and technological influences of graphic design including the creative innovators who established graphic design as a profession. Prerequisites or Corequisites: ART 210, ART 211, Junior or Senior Standing, or instructor consent. S.

ART 416. History of Art: Renaissance and Baroque. 3 Credits.
Study of European art and architecture from the fourteenth to the eighteenth century. Prerequisites: ART 210 and ART 211. S, even years.

ART 417. History of Art: Museum Studies Practicum. 3 Credits.
Experience working in an art exhibition setting involving practical experience, research, a written paper and presentation. Prerequisites: ART 210 and ART 211. F.

ART 419. History of Art: Late 18th through the 19th Century Art. 3 Credits.
Study of the major artists and artistic movements from the French Revolution to Impressionism. Prerequisites: ART 210 and ART 211. F, odd years.

ART 423. History of Art: 20th and 21st Century. 3 Credits.
Study of artists, concepts, subjects, styles, media, and artistic processes from c. 1900 to the present. Prerequisites: ART 210 and ART 211. F.

ART 424. History of Art: Non-Western Traditions. 3 Credits.
Study of art outside European traditions. Course topics will rotate to include the art of Asia, Africa, Oceania, and Native arts of the Americas. Prerequisites: ART 210 and ART 211. S, odd years.

ART 490. Special Projects/Independent Research. 1-6 Credits.
Advanced independent study within a specific art discipline outside of subject areas normally covered within regularly scheduled courses in studio art, graphic design, art history and art education. Formal contract must be signed with professor of record. Repeatable, no more than 6 credits in each discipline area. Prerequisites: Senior standing and permission of instructor. Repeatable to 12 credits. F,S,SS.

Arts and Sciences

The College of Arts and Sciences offers one non-departmental course at the graduate level, A&S 599 Special Topics. This course provides for on-demand courses in areas of particular relevance when students or faculty members wish to initiate them; it can also provide special-interest courses for particular groups.
of students and it can also serve as a curricular laboratory for experimental courses which may later be established as regular offerings within departments or programs. A&S 599 Special Topics may also be used for Special Topics courses which are cross-disciplinary or multi-disciplinary in nature. Students and faculty members wishing to initiate course offerings under A&S 599 Special Topics should present their proposals in writing to the Dean of the College. See the Arts and Sciences website (http://arts-sciences.und.edu/) for the appropriate A&S course request forms.

Courses

A&S 599. Special Topics. 1-4 Credits. Repeatable.

Atmospheric Sciences

http://www.atmos.und.edu/

FACULTY: Askelson, Delene, Gilmore, Kennedy, Osborne (Graduate Director), Mullendore, Poeliot (Chair), and Zhang

Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Department of Atmospheric Sciences offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. The Master of Science program is intended to serve those who are interested in continuing studies at the doctoral level as well as those seeking advanced knowledge for professional work in the atmospheric sciences in general. The Doctor of Philosophy program is intended to prepare students for leadership roles in academia, government, and private industry in the field of atmospheric science by enabling graduates to fill critical roles in leading research efforts, guiding science policy, educating future scientists, and creating opportunities in private industry.

Our vision is to offer premier atmospheric sciences graduate programs serving our students and the broader scientific community. In striving to achieve this distinction, the Department of Atmospheric Sciences maintains graduate programs that are socially relevant, serve as an advocate for graduate education campus-wide, provide resources that support graduate student research, and foster interdisciplinary programs. Within the context of the broader university community, the Department of Atmospheric Sciences serves to create an academic and intellectual climate that appreciates and respects diversity, values creativity, and supports the academic potential of each graduate student.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Department of Atmospheric Sciences master’s program is to provide quality educational experiences to students to promote critical thinking and foster interdisciplinary programs. Within the context of the broader university community, the Department of Atmospheric Sciences serves to create an academic and intellectual climate that appreciates and respects diversity, values creativity, and supports the academic potential of each graduate student.

Mission Statement and Program Goals

Goal 1: Students will develop a comprehensive understanding of atmospheric sciences and related disciplines, enables growth of student skill sets (analytical, technical, and communication), and emphasizes leadership, research, and innovation among its students and faculty.

Goal 1: Students will develop deep knowledge in particular atmospheric sciences sub-disciplines through their research activities while also broadening their knowledge base through coursework.

Goal 2: Students will enhance their analytical, technical, and communication skills through their research activities and course work and will develop the ability to carry out independent and original scientific research.

Goal 3: Students will develop skills that will enable them to fill critical roles in leading research efforts, guiding science policy, educating future scientists, and creating opportunities in industry.

Master of Science (M.S.)

Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university. For U.S. degrees, accreditation must be by one of the six regional accrediting associations.

2. Completion of a minimum of 20 semester credits of appropriate undergraduate work, e.g., physics, mathematics, chemistry, engineering, and/or atmospheric science.

3. A cumulative GPA of at least 2.75 for all undergraduate work or a GPA of at least 3.00 for the last two years.

4. Scores on the general portion of the Graduate Record Examination (GRE).

5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the graduate catalog.

Applicants will be evaluated on an individual basis and those with limited backgrounds in the aforementioned areas (physics, mathematics, chemistry, and atmospheric science) but with a distinguished record in other disciplines may be accepted on a qualified basis with the understanding that deficiencies would be remedied early in the program.

Degree Requirements

Students seeking the Master of Science degree through the Department of Atmospheric Sciences at the University of North Dakota must satisfy all general degree requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Atmospheric Sciences.

The Master of Science program requires that students complete a minimum of 30 credit hours for the thesis option or a minimum of 32 credit hours for the non-thesis option. Approval of the thesis option will be granted based upon alignment of research interests with departmental faculty’s research interests and faculty availability. The non-thesis option requires the student to independently investigate a topic related to the major field and successfully complete a written comprehensive examination. This study need not be an original contribution to knowledge, but may be a presentation, analysis, and discussion of ideas already in the literature of the field. This non-thesis requirement ensures that students can investigate a topic and organize a scholarly report.

Required Courses: All students are required to complete at least one course from each of the core areas listed below in addition to completing ATSC 500 Introduction to Atmospheric Research. Non-thesis option students must also complete two credits of ATSC 997 Independent Study Report (Non-Thesis Option), and thesis option students must also complete 4-9 credits of ATSC 998 Thesis.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 500</td>
<td>Introduction to Atmospheric Research</td>
<td>1</td>
</tr>
<tr>
<td>Select one of the following (Dynamics):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATSC 505</td>
<td>Advanced Atmospheric Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 518</td>
<td>Advanced Synoptic Meteorology</td>
<td></td>
</tr>
<tr>
<td>ATSC 548</td>
<td>Advanced Mesoscale Dynamics</td>
<td></td>
</tr>
<tr>
<td>Select one of the following (Physical):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATSC 450</td>
<td>Introduction to Cloud Physics Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 520</td>
<td>Atmospheric Chemistry</td>
<td></td>
</tr>
<tr>
<td>ATSC 525</td>
<td>Atmospheric Radiation</td>
<td></td>
</tr>
</tbody>
</table>
Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. In addition, students must fulfill the requirements below for admission to the Atmospheric Sciences doctoral degree program.

1. A bachelor’s or master’s degree from a recognized institution. For U.S. degrees, accreditation must be by one of the six regional accrediting associations.
2. A cumulative GPA of at least 3.00 for all undergraduate work.
3. A GPA of at least 3.00 in all graduate level work.
4. A combined score of 300 in the quantitative and verbal sections of the Graduate Record Examination (GRE).
5. Be recommended for doctoral work by the department.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
7. Students with a bachelor’s degree may apply directly to the Ph.D. program and must include within their application:
   a. At least one letter of recommendation that comments on their research ability, and
   b. A sample of their previous research, or, provide a research topic proposal and how that research will be executed, completed, and presented within the first year of the Ph.D. program.
8. In rare circumstances, students who begin the M.S. program in Atmospheric Sciences may bypass the M.S. and be admitted into the Ph.D. program with a unanimous recommendation by the departmental faculty and by first satisfying all other Ph.D. admission requirements of the UND School of Graduate Studies and Atmospheric Sciences Department including #7 above. Application materials should be submitted to the Graduate Committee in the Department of Atmospheric Sciences. The student need not have completed their M.S coursework at the time of application. The student would then be subject to the additional degree requirements stated in section 6 of “Degree Requirements” below.

Degree Requirements

Students seeking the Doctor of Philosophy degree through the Department of Atmospheric Sciences at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Atmospheric Sciences. These degree requirements include:

1. Completion of 90 semester credits beyond a bachelor’s degree or 60 semester credits beyond a master’s degree.
2. Two consecutive years of full-time academic work completed in residence at the University of North Dakota campus. With approval of a student’s Faculty Advisory Committee, one of these years may be completed through full-time academic work and/or research at another institution or location.
3. At least 40 of the post-bachelor’s credits or 27 of the post-master’s credits must be formal coursework. A minimum of two-thirds of these credits must be taken in the Atmospheric Sciences department.
4. Up to 9 credits may be taken through distance education.
5. Completion of ATSC 500 Introduction to Atmospheric Research and ATSC 505 Advanced Atmospheric Dynamics or equivalent classes.
6. Students who have been admitted under admission requirements #7 or #8 above must successfully present research in written and oral form during their first year of the Ph.D. program, subject to approval by the Departmental Graduate Committee and the student’s Doctoral Committee. Those students approved will finish coursework and progress toward comprehensive exams and Ph.D. candidacy while those not approved will be dismissed.
7. Satisfactory completion of a written and oral doctoral comprehensive examination in Atmospheric Sciences is required before advancement to Ph.D. candidacy is granted. Students may attempt the written comprehensive exam twice.
8. Students are required to complete independent research that culminates in a dissertation, a public departmental seminar, and final examination.

Courses

ATSC 500. Introduction to Atmospheric Research. 1 Credit.
This course is required for all Atmospheric Science graduate students. A course in the methodology and philosophy of doing research in the atmospheric sciences. Also includes discussion of related topics, including creativity, publication, science and society, and career-related activities. S/U grading.

ATSC 505. Advanced Atmospheric Dynamics. 4 Credits.
A graduate level course in linear perturbation theory, atmospheric oscillations, hydrodynamic instability and the life cycle of extratropical cyclones.

ATSC 510. General Circulation. 3 Credits.
Covers the large scale dynamical processes in the atmosphere, including the observed circulation, processes that maintain the circulation, mid-latitude wintertime circulation anomalies, large scale structure of the tropical atmosphere, and the stratosphere and its link to the troposphere. Prerequisite: ATSC 505.

ATSC 515. Advanced Climatology. 3 Credits.
A course on climate from the perspective of utilizing climatic knowledge and information to examine the current state of the climate and how this can be used to explore potential future states. Topics included are an introduction to climatology, basic data and their analysis, climatological analysis, statistical methods, applications and synoptic climatology. Prerequisite: ATSC 540.

ATSC 518. Advanced Synoptic Meteorology. 3 Credits.
Advanced analysis of atmospheric processes important to large-scale flows. Quasigeostrophic and semi-geostrophic theory, behavior of extratropical systems, fronts and jets, geotropic adjustment, blocking and IPV thinking. Prerequisite: ATSC 505 or equivalent.

ATSC 520. Atmospheric Chemistry. 3 Credits.
Composition of clean and polluted air. Sources and sinks of atmospheric gases and aerosols. The role of atmospheric chemistry in global environmental issues such as acid rain, visibility reduction, climatic change, oxidant enhancement, etc.

ATSC 525. Atmospheric Radiation. 3 Credits.

ATSC 528. Atmospheric Data Analysis. 3 Credits.
Introduction to techniques used in the analysis of meteorological data and methods for interpreting their effects: polynomial fitting, method of successive corrections, statistical methods, variational techniques, model initialization, data assimilation, and filter design. Prerequisite: Proficiency in a programming language.

** Courses taken at the undergraduate level cannot be repeated for graduate credit.
ATSC 530. Numerical Weather Prediction. 3 Credits.
Covers scale analysis in atmospheric prediction; numerical methods; various atmospheric prediction models; the use of filtering, smoothing, interpolation, weighting and adjustment in objective analysis techniques; numerical forecasting; current NWP structures and applications. Prerequisite: ATSC 505.

ATSC 535. Measurement Systems. 3 Credits.
An advanced course in meteorological measurement systems, including coverage of performance characteristics of sensors, calibration standards, measuring devices, the effects of making measurements in the atmospheric environment, meteorological measurement systems, and digital data logging and processing.

ATSC 538. Advanced Earth System Sciences. 3 Credits.
Introduction and synthesis of understanding of the components of the Earth system, their interactions, and the consequences of changes in the Earth system for life; identify and quantify Sun-Earth connections associated with solar variability and impact on the Earth System; explore interactions among the major components of the Earth system: continents, oceans, atmosphere, ice, and life; distinguish natural from human-induced causes of change; understand and predict the consequences of change; and consider analysis techniques, with emphasis placed on numerical modeling of phenomena. Prerequisite: Permission of instructor.

ATSC 540. Statistical Methods in Atmospheric Science. 3 Credits.
A course on statistical methods used to describe, analyze, test, and predict atmospheric phenomena. The topics will review basic statistical concepts, statistical data interpretation, theoretical probability distributions, hypothesis testing, uncertainty analysis, regression, time series analysis, and statistical weather prediction and verification. Prerequisite: Must have completed course work in statistics or consent of instructor.

ATSC 545. Hydrometeorology. 3 Credits.
A course designed to study the coupling of atmospheric and hydric processes. Topics will cover basic hydric concepts, review of atmospheric thermodynamics, atmospheric moisture, precipitation processes, hydrologic cycle, evaporation/evapotranspiration, infiltration, snow and snowmelt processes, runoff mechanisms, land surface processes, and hydrologic modeling.

ATSC 548. Advanced Mesoscale Dynamics. 3 Credits.
An in-depth theoretical and analytical examination of mesoscale convective processes, initiation and characteristics; mesoscale features of tropical systems; orographically-forced and -influenced circulations; local and regional circulations; high-latitude mesoscale systems; an introduction to mesoscale model design, parameterization development, and evaluation. Prerequisite: Upper division or graduate course in dynamics or consent of instructor; ATSC 505 is a recommend corequisite but not required.

ATSC 550. Tropical Meteorology. 3 Credits.
A study of tropical phenomena over a range of scales, including small scale (cumulus clouds, thunderstorms), mesoscale (sea breezes, squall lines), large scale (waves and cyclones), and planetary scale circulations (trade winds, equatorial trough, equatorial waves, monsoons, intraseasonal oscillations, ENSO). Methods for obtaining and using information to study tropical phenomena are examined. Prerequisite: Graduate standing.

ATSC 552. Satellite Meteorology. 3 Credits.
A study of remote sensing technologies for atmospheric applications. Topics include basic radiation and remote sensing methods, image data processing, atmospheric and geometric corrections, radiometric and geometric enhancements, image classification, and selected meteorological applications using satellite remote sensing. S, even years.

ATSC 553. Advanced Satellite Meteorology. 3 Credits.
Addresses advanced topics in satellite meteorology. Includes advanced topics in radiation, scattering by molecules and particles, and retrieval theory and methods for meteorological applications using passive and active satellite remote sensing. Prerequisites: ATSC 552 and ATSC 525. F, even years.

ATSC 555. Advanced Surface Transportation Weather. 3 Credits.
Addresses weather research topics in contemporary surface transportation. Includes maintenance decision support systems construction, applications of artificial intelligence methods, and investigation of land surface effects and applications of advanced mesoscale weather prediction modeling in a surface transportation environment. Prerequisite: ATSC 510 or consent of instructor.

ATSC 560. Boundary Layer Meteorology. 3 Credits.
The interaction of the atmosphere with the earth's surface. The transfer of heat, moisture, and momentum between the atmosphere and the underlying surface. The description of turbulence and the effects of turbulence on the transfer properties of the atmosphere. Prerequisite: ATSC 505.

ATSC 565. Air Quality. 3 Credits.
An in-depth introduction to important areas within the air quality field. Topics covered include the physical and chemical nature of air pollutants; their sources, control, and transport through the atmosphere; their interaction with other atmospheric constituents; their removal through cloud processes, fallout and wet deposition; their effects on visibility, human health, ecosystems, and global climate. Methods related to the measurements of atmospheric pollutants, air quality modeling, and air quality forecasting are discussed. Prerequisites: CHEM 121 or equivalent, and PHYS 251 or equivalent.

ATSC 570. Seminar. 1 Credit.
A discussion course on current research topics and publications related to the field of atmospheric sciences. Students, faculty and guest speakers will present their research and lead the discussion during seminar. Repeatable to 3 credits. Repeatable to 3 credits. S/U grading.

ATSC 575. Current/Special Topics in Meteorology. 3 Credits.
A course in specific advanced topics in atmospheric sciences. Largely delivered in a structured, lecture format. Repeatable to 12 credits. Repeatable to 12 credits.

ATSC 594. Independent Studies. 2-4 Credits.
Survey investigations, literature searches and/or preliminary research topic of interest to the student. Repeatable to 4 credits. Repeatable to 4 credits.

ATSC 596. Supervised Research. 1-4 Credits.
Research in consultation with departmental faculty. Repeatable to 12 credits. Prerequisites: Master's degree student and consent of the instructor. Repeatable to 12 credits. S/U grading.

ATSC 598. Dissertation Research. 1-8 Credits.
Research, in support of the doctoral dissertation, performed in consultation with the student's advisor. Repeatable to 15 credits. Prerequisite: Consent of the instructor. Repeatable to 15 credits. S/U grading.

Students are required to complete at least one course from each of the core areas: dynamics, physical, earth system, and tools, as well as ATSC 500. This course is required for all Atmospheric Science graduate students enrolled in the non-thesis option. Students will be required to independently investigate a topic related to the major field. This study need not be an original contribution to knowledge, but may be a presentation, analysis, and discussion of ideas already in the literature of the field. Prerequisite: Students are required to complete at least one course from each of the core areas: dynamics, physical, earth system, and tools, as well as ATSC 500. S/U grading.

ATSC 998. Thesis. 1-6 Credits.
Repeatable to 9 credits. Repeatable to 9 credits.

ATSC 999. Dissertation. 1-9 Credits.
Repeatable to 18 credits. Repeatable to 18 credits.

Undergraduate Courses for Graduate Credit
ATSC 441. Radar Meteorology. 4 Credits.
Advanced radar theory, including basic radar principles, digital processing of radar signals, Doppler radar principles, displays, polarization techniques, and characteristic returns. Includes laboratory. Prerequisite: ATSC 345 or consent of instructor. S, odd years.

ATSC 450. Introduction to Cloud Physics Meteorology. 4 Credits.
A study of the physics of clouds with emphasis on microphysical processes involved in cloud formation, precipitation production, and dissipation. Includes Laboratory. Prerequisites: ATSC 350 and ATSC 353. F, odd years.

Aviation
http://www.masters.avit.und.edu
FACULTY: Bjerke, Bridewell, Carlson, Daku, Drechsel, Dunebury, Higgins (Chair), Jensen, Jorgenson, Kenville (Graduate Program Director), Lindseth, Lovelace, Petros, Ulrich, Vacek, Venhuizen, and Wild.

Degree Granted: Master of Science (M.S.)

The Aviation Department offers a graduate program leading to the Master of Science degree. The M.S. in Aviation degree provides the necessary educational background for aviation industry professionals to solve problems within the field of aviation including the airlines, corporate aviation, general aviation, and airport management. Graduates will gain an understanding of the various complexities facing the industry through a breadth of aviation industry related courses. In addition, graduates will gain an understanding of statistics and research methods, and how they may be applied to research and solving problems within the aviation industry. The program will provide graduates with the knowledge and skills that prepare them for the aviation industry, aviation related government positions and for further research and development in the field of aviation.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Aviation Department graduate program is to provide quality educational experiences to students that promote critical thinking and foster an intellectual environment conducive to exemplary research, scholarship and creativity among graduate students and faculty in an effort to provide problem-solving professionals to aviation industry employers.

Goal 1: Develop aviation professionals who use their technical and theoretical skills to solve problems within the aviation industry.

Goal 2: Develop a student’s higher-order thinking abilities and instill a quest for lifelong learning.

Goal 3: Develop a scholarly set of skills that will allow the student to function in a professional manner.

Goal 4: Students will be able to write at an advanced level.

Goal 5: Students will be able to effectively present their ideas using a variety of media.

Goal 6: Students will be able to critically think, analyze and evaluate all types of information available in today’s global society.

Aerospace Sciences

http://www.aero.und.edu/

FACULTY: (Avit) Bjerke, Bridewell, Drechsel, Higgins, Jensen, Kenville (Graduate Program Director), Lindseth, Petros, Ulrich, Vacek, and Venhuizen

FACULTY: (SpSt) Casler (Chair), Dodge, (Graduate Program Director) Fevig, Gaffey, Hardersen, Ryalov, Seelan

Aerospace Sciences Degree (Ph.D.)

Mission Statement and Program Goals

The mission of the Aerospace Sciences Ph.D. program is to provide interdisciplinary teaching and research at the highest academic levels. The goal is to provide highly educated scholars and leaders with the skills necessary to mix technology and science with an understanding of the politics and economics of the aerospace fields.

1. Students will develop a thorough knowledge of the aerospace elements specifically related to the Aviation and Space Studies disciplines that will allow them to be successful leaders in the industry by applying solutions gained through theory and applied research.

2. Students will enhance their analytical, technical, research and communication skills through classroom and research activities to further develop an ability to carry out independent, original and applied research.

3. Students will further develop the critical skill set needed to enable them to fill leadership roles within government and research agencies, educational institutions or private aerospace and aviation sector companies.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor’s degree in Aviation/Aeronautics or Bachelor’s degree from an accredited institution—a minimum of 20 semester credits of appropriate aviation related undergraduate work.

2. Graduate Record Examination, General Test.

3. Overall undergraduate GPA of 2.75 or a GPA of at least 3.00 for the last two years of undergraduate work.

4. Aviation industry experience, which can include any Federal Aviation Administration (FAA) certificates (pilot, mechanic, air traffic, dispatch, ground, etc.) or applied aviation industry knowledge.

5. Students must submit a 2-3 page paper addressing specific questions per departmental guidelines. One of the questions will address the potential thesis or independent study topic. Students who do not possess an FAA certificate must submit a 2-3 page paper/resume outlining their aviation industry experience.

6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

1. Required Core Courses are as follows:

2. A minimum of 30 credits including the 4-credit thesis option, or a minimum of 32 credit hours including comprehensive exams and the 2-credit independent study option. Approval of the thesis option will be granted based upon alignment of research interest with departmental faculty’s research interests and faculty availability.

3. Comprehensive exams are required for those choosing the Independent Study option.

4. Courses 510 – 590 should be taken after the required “core” courses are completed.

5. Follow the Graduate Catalog and Graduate Student Handbook, Master’s Degree for completion of:

   a. Program of Study
   b. Advisor Selection
   c. Independent Study/Thesis Option
   d. Topic Proposal

6. AVIT 590 Aviation Seminar and AVIT 593 Individual Research in Aviation can be taken with permission from a sponsoring faculty member.

7. Must have an overall Grade Point Average (GPA) of 3.0

8. In addition to the required core courses, students will have selected elective courses or from other UND-approved graduate courses from the following list to complete the degree:

9. AVIT 510 Aviation Public Policy and Regulations 3

AVIT 511 Aviation Information Technology 3

AVIT 512 Aviation Environmental Issues 3

AVIT 513 Aviation Safety Management Systems 3

AVIT 514 Aviation Management Theory 3

AVIT 515 Human Factors: Human Perceptions in Information Systems Design 3

AVIT 516 Training System Design 3

AVIT 517 Airline Labor Relations and Law 3

AVIT 518 Human Error 3

AVIT 520 Strategic Airport Planning 3

AVIT 521 Ethics in Aerospace 3

AVIT 587 Supervised Field Work 3

AVIT 590 Aviation Seminar 1-3

AVIT 591 Readings in Aviation 1-3
### Domestic Air Law Specialization

The Master of Science program currently offers an area of specialization in Domestic Air Law in collaboration with the UND School of Law. In order to receive this specialization:

1. Be fully admitted to the UND School of Graduate Studies and be in good academic standing in the MS-Aviation program;
2. Have completed AVIT 501 General Issues in Aviation/Aerospace, AVIT 502 Aviation Economics and AVIT 503 Statistics and be in their second year of the MS-Aviation program;
3. Receive permission from the Aviation Graduate Program Director;
4. Successfully complete 9 credits of coursework in the UND School of Law including:
   a. LAW 210, and;
   b. 6 credits from the following:
      i. LAW 212
      ii. LAW 214
      iii. LAW 263
      iv. LAW 282
      v. LAW 291
      vi. LAW 299

### Aerospace Sciences Degree (Ph.D.)

#### Admission Requirements

The applicant must meet The School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. All elements must be complete by the published application date. The additional requirements for admission to the Aerospace Sciences Ph.D. program are as follows:

1. A Master’s or graduate degree from an accredited institution with a GPA of at least 3.25/4.0
2. Submission of a statement of personal goals
3. Professional resume
4. Satisfy the School of Graduate Studies English Language Proficiency requirements as published in the graduate catalog.
5. The Graduate Record Examination (GRE) General Exam
6. Industry experience preferred

#### Financial Assistance

Financial aid in the form of teaching, research or service assistantships and tuition waivers are available from a variety of internal and external sources and are awarded on a competitive basis. These appointments are renewable if students are making satisfactory progress toward the degree and their work is satisfactory. Applications for funding opportunities should coincide with the program application date.

#### Degree Requirements

- Ninety credits beyond a baccalaureate degree. With approval of the Aerospace Sciences Ph.D. Program and the UND School of Graduate Studies, up to thirty credits from a master’s degree from an accredited institution can be applied toward the requirements of the doctoral degree.
- Successful completion of sixty semester credits beyond the master’s degree
- Successful completion of qualifying exam prior to advancement to candidacy
- Twelve to eighteen semester credits of dissertation (AVIT 999 Dissertation or SPST 999 Dissertation) and successful defense of the dissertation

### Course Designations (SPST)

#### Social area courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SPST 450</td>
<td>International Space Programs</td>
<td>3</td>
</tr>
<tr>
<td>SPST 540</td>
<td>Space Economics and Commerce</td>
<td>3</td>
</tr>
<tr>
<td>SPST 541</td>
<td>Management of Space Enterprises</td>
<td>3</td>
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<tr>
<td>SPST 545</td>
<td>Space and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>SPST 551</td>
<td>History of the Space Age</td>
<td>3</td>
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<tr>
<td>SPST 552</td>
<td>History of Astronomy and Cosmology</td>
<td>3</td>
</tr>
<tr>
<td>SPST 555</td>
<td>Military Space Programs</td>
<td>3</td>
</tr>
<tr>
<td>SPST 560</td>
<td>Space Politics and Policy</td>
<td>3</td>
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<tr>
<td>SPST 561</td>
<td>Public Administration of Space Technology</td>
<td>3</td>
</tr>
<tr>
<td>SPST 565</td>
<td>Space Law</td>
<td>3</td>
</tr>
<tr>
<td>SPST 574</td>
<td>Remote Sensing in Developing Countries</td>
<td>3</td>
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<tr>
<td>SPST 575</td>
<td>Remote Sensing Law and Policy</td>
<td>3</td>
</tr>
<tr>
<td>SPST 581</td>
<td>Field Visit to Space Centers</td>
<td>1-3</td>
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#### Technical area courses:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SPST 405</td>
<td>Space Mission Design</td>
<td>3</td>
</tr>
<tr>
<td>SPST 410</td>
<td>Life Support Systems</td>
<td>3</td>
</tr>
<tr>
<td>SPST 425</td>
<td>Observational Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>SPST 430</td>
<td>Earth System Science</td>
<td>3</td>
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<tr>
<td>SPST 435</td>
<td>Global Change</td>
<td>3</td>
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<tr>
<td>SPST 460</td>
<td>Life in the Universe</td>
<td>3</td>
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<tr>
<td>SPST 500</td>
<td>Introduction to Orbital Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>SPST 505</td>
<td>Spacecraft Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SPST 506</td>
<td>Advanced Orbital Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>SPST 512</td>
<td>Human Performance in Extreme Environments</td>
<td>3</td>
</tr>
<tr>
<td>SPST 515</td>
<td>Human Factors in Space</td>
<td>3</td>
</tr>
<tr>
<td>SPST 519</td>
<td>Closed Ecological Systems for Life Support</td>
<td>3</td>
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<tr>
<td>SPST 520</td>
<td>Asteroids, Meteorites and Comets</td>
<td>3</td>
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<tr>
<td>SPST 521</td>
<td>The Planet Mars</td>
<td>3</td>
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<tr>
<td>SPST 522</td>
<td>Remote Sensing Principles</td>
<td>3</td>
</tr>
<tr>
<td>SPST 523</td>
<td>Remote Sensing Applications</td>
<td>3</td>
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</tbody>
</table>
AVIT Courses

AVIT 501. General Issues in Aviation/Aerospace. 3 Credits.
This course is designed to introduce students to graduate school, library resources, and faculty research interests. This course explores the historical, current, and future issues related to the aerospace industry.

AVIT 502. Aviation Economics. 3 Credits.
An in-depth examination of the economic aspects of the air transportation industry, with microeconomic analysis applied to decision making in the airline, general and corporate aviation, and airports. Topics include: basic economics of air transport supply and demand; demand forecasting; cost drivers; yield, revenue and capacity management; regulatory issues; political influences; and unique economic characters of international commercial aviation.

AVIT 503. Statistics. 3 Credits.
This course is an in-depth study of inferential statistics with emphasis on the analysis of variance models and subsequent comparison procedures. In addition, the course will include coverage of correlation and multiple regression techniques as data analytic tools. Also, coverage of survey construction and analysis of survey data will be presented. Course content will be presented within the context of aviation and psychology examples. (Psychology 541: Advanced Univariate Statistics can be substituted for AVIT 503). Prerequisite: An introductory statistics course or calculus course.

AVIT 504. Research Methods. 3 Credits.
Methods and procedures of development, design and analysis related to aviation industry research. Topics include problem identification, review of literature, research design, and data analysis. This course is designed to give an overview of quantitative, qualitative and mixed-method approaches research design. The course includes the experience of critically evaluating research projects and developing a research project based on the principles discussed in class. Prerequisites: AVIT 501, and AVIT 503 or PSYC 541. F.

AVIT 505. Qualitative Research Methods. 3 Credits.
Examination and analysis of qualitative research design with particular emphasis on approaches relevant to problems in Aerospace Studies or related fields. Students will design a qualitative research project.

AVIT 506. Quantitative Research Methods. 3 Credits.
The purpose of this course is to provide students the opportunity to acquire knowledge and skills necessary to apply quantitative research and multiple regression methods in research. Students will design a quantitative research project. Prerequisite: A graduate level Statistics course.

AVIT 507. Advanced Research Methods. 3 Credits.
This course will be a thorough discussion of the different methodologies utilized in theoretical and applied research. Experimental and quasi-experimental design, and topical areas of survey methodology data mining, simulations, and techniques for design and implementation of research. Prerequisites: AVIT 503, AVIT 505, and AVIT 506.

AVIT 510. Aviation Public Policy and Regulations. 3 Credits.
A discussion of the initiation, formulation and implementation of aviation public policies and their effects upon the various segments of the aviation industry. Various regulatory areas such as scheduled air carriers, general aviation, airport operations, air traffic control and international agreements will be analyzed.

AVIT 511. Aviation Information Technology. 3 Credits.
This course is an introduction to information systems essential to an aviation business professional. It will provide an overview of current and emerging technologies in various database, data communication and e-commerce systems.

AVIT 512. Aviation Environmental Issues. 3 Credits.
This course examines current environmental issues within the aviation industry in the context of historical environmentalism, current laws and regulations, and emerging research findings. A broad survey of earth systems precedes a focused examination of contemporary aviation environmental issues.

AVIT 513. Aviation Safety Management Systems. 3 Credits.
An in-depth study of aviation safety management concepts and principles as they relate to effective safety programs within the airlines, corporate aviation, general aviation and airports.

AVIT 514. Aviation Management Theory. 3 Credits.
An in-depth review of organizations in the aviation industry, their structures, environments and leadership as it relates to human behavior. Topics include organizational design, climate and the interactions with individuals, groups, and different organizational structures within the airline, general aviation, corporate aviation and airport organizations.

AVIT 515. Human Factors: Human Perceptions in Information Systems Design. 3 Credits.
Human perception and information processing will be discussed in relation to information system design requirements to optimize human performance. Topics include information systems design with regard to compatibility, perception, attention, situation awareness and decision processes. Applications to current workstation design will allow students to have a greater understanding of human centered design goals.

AVIT 516. Training System Design. 3 Credits.
The process of memory, learning, and judgment will be related to instructional design strategies in the aviation industry, where heavy use of simulation is used in the training and evaluation of aviation professionals. Topics include instructional design and assessment concepts, simulation design and decision making skills. Class presentations include operational problem-solving group work as well as research paper reviews.

AVIT 517. Airline Labor Relations and Law. 3 Credits.
This course will examine the impact and application of the Railway Labor Act as it pertains to airline operations. Topics of study will include labor history; organization; alternative dispute resolution, collective bargaining, including interest-based practices; and emerging labor trends.

AVIT 518. Human Error. 3 Credits.
The objective of this course is to develop a deeper understanding of the human error and its impact upon human performance in variety of fields. Prerequisite: Graduate Admission. S.

AVIT 520. Strategic Airport Planning. 3 Credits.
This course will explore the elements of airport planning within the public administration domain. Emphasis will be placed on individual airport's strategic plans, how airports operate efficiently and effectively with changing regulations and economic fluctuations in the global marketplace.

AVIT 521. Ethics in Aerospace. 3 Credits.
The course will introduce ethical concepts and frameworks used in professional decision-making. Students will engage with faculty and outside speakers to weigh decisions in the applicable ethical frameworks. Students participation will include graded elements of formal case presentations, class discussion sessions, essay examinations and review of scholarly and trade journal articles. The course will have a strong emphasis on research project design to assess dynamics of ethical decision-making in different populations, as well as exploring educational opportunities in the aerospace industry.

AVIT 522. UAS Management. 3 Credits.
This course provides a series of lectures or presentations by visiting lecturers or faculty on various themes related to Unmanned Aircraft Systems (UAS). Prerequisite: Graduate Student Status. F, odd years.

AVIT 523. Aviation Safety Data Analysis. 3 Credits.
The objective of this course is to obtain an understanding of various safety programs conducted throughout the aviation industry and examine the underlying analytical techniques associated with each program. Prerequisite: Graduate student status. SS.

AVIT 524. Air Traffic Management. 3 Credits.
This course will explore the elements of Air Traffic and Next Gen. There will be a discussion on how air traffic control works and the evolution of the Air Traffic Management of the National Airspace System in the US and abroad. Emphasis will be on the current day issues and how Air Traffic Management is changing not only in the US but in Canada, Europe and worldwide. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science, The Aerospace PhD program, or consent of the instructor. S, odd years.
AVIT 525. Legal Issues in Aviation. 3 Credits.
The course will introduce legal concepts and frameworks of the United States' legal system. Issues particular to the aviation industry will be discussed. Students will engage in formal case presentations and discussions to gain an understanding of the legal issues faced in the aerospace industry. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science program, the Aerospace PhD program, or consent of the instructor. SS, even years.

AVIT 587. Supervised Field Work. 1-3 Credits.
Used primarily for individualized field placement so that the student may acquire practical experiences in the aviation industry. Prerequisite: Consent of graduate director. Repeatable to 6 credits. S/U grading.

AVIT 590. Aviation Seminar. 1-3 Credits.
A series of lectures presented by visiting lecturers and the faculty. Repeatable to 9 credits.

AVIT 591. Readings in Aviation. 1-3 Credits.
Readings in selected Aerospace Studies topics, with written and/or oral reports. Prerequisite: Consent of instructor. Repeatable to 6 credits.

AVIT 593. Individual Research in Aviation. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits for Master's and up to 12 credits for Ph.D. Repeatable to 6 credits.

AVIT 595. Aviation Capstone. 3 Credits.
The Capstone course integrates, extends and applies knowledge learned in earlier Aviation courses and research projects. The course also undertakes an in-depth study of management theories relevant to the aviation industry and how leaders apply these theories in practice. Students will have the opportunity to demonstrate their knowledge and leadership abilities by working in teams to design and develop a solution to a current aviation problem, which will be assigned by the instructor. This effort will culminate in an on-campus presentation to the faculty and invited industry experts. Prerequisite: AVIT 504 or permission of instructor.

AVIT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

AVIT 997. Independent Study. 2 Credits.
Independent study and preparation of a written report for students taking the non-thesis option in the Master's program.

AVIT 998. Thesis. 4 Credits.
Preparation and defense of a thesis based on original research. Prerequisite: Admission committee approval and consent of instructor. Repeatable to 4 credits.

AVIT 999. Dissertation. 1-12 Credits.
An original research project approved by and completed under the supervision of a dissertation committee. Prerequisites: Graduate standing, approval, completion, and defense of dissertation proposal. Repeatable to 18 credits.

SPST Courses

SPST 500. Introduction to Orbital Mechanics. 3 Credits.
This course introduces students without much background in either mathematics or physics to the problems faced everyday by orbital analysts as they track the 7000 satellites which orbit the earth. The course gives the students an ability to converse, as managers and co-workers, with those individuals who are calculating these difficult orbits. This appreciation is important in both the civilian and military sides of the space program. On demand.

SPST 501. Survey of Space Studies I. 3 Credits.
SPST 501 is the first course in a two-course sequence (along with SPST 502) in Space Studies that introduces new students to essential knowledge that will be necessary to successfully complete their M.S. degree in space studies. SPST 501 consists of the following six modules: 1) space history, 2) space policy, 3) space law, 4) planetary and space sciences, 5) space life sciences and human factors, and 6) Earth remote sensing. All modules contain foundational information that will give students the basic knowledge and skills necessary to achieve a broad understanding of the multi- and interdisciplinary nature of space studies; knowledge that can be applied in later courses, such as Capstone; and knowledge that facilitates thesis and other specialized types of instruction and research. Course content in SPST 501 will also be used to assess student learning at the end of their M.S. program via the Comprehensive Examination. Students are expected to master and understand course content, be able to apply course content as appropriate, and demonstrate their understanding of course content prior to graduation. F.

SPST 502. Survey of Space Studies II. 3 Credits.
SPST 502 is the second course in a two-course sequence (along with SPST 501) in Space Studies that introduces new students to essential knowledge that will be necessary to successfully complete their M.S. degree in space studies. SPST 502 consists of the following five modules: 1) space mission design (two modules), 2) orbital mechanics, 3) launch vehicles and propulsion, and 4) robotic-spacecraft instrumentation. All modules contain foundational information that will give students the basic knowledge and skills necessary to achieve a broad understanding of the multi- and interdisciplinary nature of space studies; knowledge that can be applied in later courses, such as Capstone; and knowledge that facilitates thesis and other specialized types of instruction and research. Course content in SPST 502 will also be used to assess student learning at the end of their M.S. program via the Comprehensive Examination. Students are expected to master and understand course content, be able to apply course content as appropriate, and demonstrate their understanding of course content prior to graduation. S.

SPST 504. Research Methods in Space Studies. 3 Credits.
This course will provide an introduction to research in Space Studies emphasizing the preparation of a Ph.D. proposal and the dissertation itself. Course content will be tailored to address the specific research methods applicable to the student(s) research interests. Typically given by the student's advisor, but students preparing in the same area (e.g., Planetary Science, Astronomy) may be in a combined section. On demand.

SPST 505. Spacecraft Systems Engineering. 3 Credits.
This course will guide the students through the spacecraft design and proposal process for an actual mission. In this course the students will work in teams on individual spacecraft subsystems, participate in an engineering design review, and create a document which can be submitted for funding for a small satellite project. Lectures will provide an overview of the separate spacecraft subsystems involved in a typical mission, the systems engineering approach to spacecraft development, and the grant writing process. Distance students will interact with on-campus students via conferencing software. Prerequisite: SPST 405 or consent of instructor.

SPST 506. Advanced Orbital Mechanics. 3 Credits.
This course provides a working knowledge of the field of orbital mechanics including the use of appropriate mathematical and computational techniques, the analysis of professional papers in orbital mechanics, and applying the appropriate techniques to solve orbital mechanics problems. Topics covered include orbital elements, perturbations, coordinate systems, orbit determination, and multi-body gravitational problems. Prerequisites: SPST 500, and MATH 266 or equivalent.

SPST 508. Quality Engineering for the Space Industry. 3 Credits.
This course addresses the principles and techniques for establishing quality goals, identification of customer needs and requirements, measurement of quality, and product/process engineering to improve system performance with a focus on the space industry. The main objectives are to provide the student with an understanding of the principles and practice of quality and reliability engineering in general and to provide an in-depth understanding of the quality assurance concepts, strategies, and tools practiced in the space industry. Familiarity with the techniques learned in this course will enable the student to address problems in the design, implementation, measurement, and correction of production and service systems found in the space industry. On demand.
SPST 512. Human Performance in Extreme Environments. 3 Credits.
This course introduces the area of human performance in extreme environments, highlights differences and similarities between extreme environments, and demonstrates the lessons learned from one extreme environment can be effectively applied to others—though settings like space, mountains, or the ocean's depths, etc. pose unique characteristics, the human physiological and psychological reactions and adaptations to these extreme settings stay similar.

SPST 515. Human Factors in Space. 3 Credits.
A review of the major stresses experienced by humans on entering the new and alien environment of space. Examples will be taken from the psychological and physiological impacts experienced by U.S. and Soviet crews with emphasis on longer flights. How to avoid and/or overcome these stresses will be examined as an essential and growing need in the future development and settlement of the space frontier.

SPST 517. Human Spaceflight Systems. 3 Credits.
This course is designed to introduce students to human space systems. The course uses both an engineering and a historical approach to human spaceflight systems covering all manned spacecraft up to today, plus individual subsystems necessary for human occupation. By the end of the course, students will: 1. Understand the engineering and science concepts related to human spaceflight. 2. Understand the major technologies required for human spaceflight. 3. Apply the systems engineering process to a human spaceflight mission: a. Describe the interactions among the elements of a space mission, b. Describe the interactions among all spacecraft subsystems, c. Document design decisions and analysis in a clear and concise manner. F, even years.

SPST 519. Closed Ecological Systems for Life Support. 3 Credits.
Closed ecological systems have been suggested during the early decades of space exploration for extended life support in space operations. In reality, this principle of long-term life support mimics global biogeochemical cycles supporting life on Earth. The course covers the multiple interactions of human/bioregenerative life support based on physical/chemical regeneration (hybrid) life support environments. Extensive research in this area during more than five decades showed that material turnover in small closed environments becomes unstable compared to a planetary environment. Specific attention is paid to the limits of stability for closed material cycles functioning during long-term remote confined missions; and the importance of the human factor as a target link, main sensor, and main integrator and control element for the system providing significant self-sustainability under proper motivation. Advanced scenarios for space life support based on ecological and in situ resource utilization approaches are discussed. On demand.

SPST 520. Asteroids, Meteors and Comets. 3 Credits.
The small bodies of the solar system provide clues to the origin and early history of the solar system. The planets and larger moons have all been chemically transformed erasing their records of their formation. By contrast, many asteroids, meteors and comets are essentially unmodified from the time of their origin 4.5 billion years ago and thus preserve a record of the formation epoch. Each of these classes of objects is investigated separately, and relationships between them are examined. Implications for impact hazards and for extraterrestrial resources are also explored. The results of recent and current spacecraft missions to asteroids (e.g., Galileo, NEAR, DAWN, Hayabusa, Rosetta, OSIRIS-Rex, etc.) and to comets (e.g., Giotto, Vega 1, Stardust, Deep Impact, Rosetta, etc.) are reviewed. On demand.

SPST 521. The Planet Mars. 3 Credits.
This course provides an in-depth review of the present state of our knowledge of the planet Mars. Topics that are covered include: the origin and evolution of the planet, the surface geology and geological processes, the geophysical properties of the Martian interior, the origin and evolution of the Martian atmosphere, the present and past climates of Mars, the Martian moons, and the possibility of past or present life on Mars. The American, Soviet/Russian and other nations' Mars exploration programs are reviewed and the course incorporates the most recent results from spacecraft missions such as Mars Odyssey, the Mars Exploration Rovers (Opportunity Spirit), Mars Express (European Space Agency), Mars Reconnaissance Orbiter, Mars Science Laboratory (Curiosity Rover), MAVEN, and Mangalaayan (India's Mars Orbiter Mission). Potential future manned and unmanned missions are also discussed. On demand.

SPST 522. Remote Sensing Principles. 3 Credits.
This course covers the basic concepts and foundations of remote sensing, a review of major Earth observing satellite and aircraft platforms, and an investigation of flow of data from satellite to Earth, what it represents, and how to interpret it, using both visual and digital image processing techniques. A field visit to the EROS Data Center in Sioux Falls may also be arranged.

SPST 523. Remote Sensing Applications. 3 Credits.
This course covers the use of advanced image processing algorithms and information extraction techniques for various Earth resource applications such as land cover/land use, environmental change detection, geology, oceanography, agriculture, forestry, rangeland, water resources, urban planning, natural disaster management, etc. Prerequisite: SPST 522.

SPST 524. Current Topics in Astrobiology. 3 Credits.
This is a multi-disciplinary, literature-intensive examination of astrobiology, which is the study of life in the universe. Students will read scientific research and review papers from a variety of disciplines including astronomy, planetary science, chemistry, biology, and geology. Course goals include: developing proficiency at reading/analyzing diverse scientific papers, developing the ability to incorporate knowledge from multiple disciplines in the study of astrobiological research, and developing the ability to effectively write summary papers to show basic understanding of course material. Prerequisite: SPST 460 or consent of instructor. On demand.

SPST 525. Technical Issues in Space. 1-3 Credits.
An examination of the technological base for the exploration and development of space. An understanding of this technology and of its impact is essential to an understanding of the issues and problems associated with our continuing efforts to explore and settle this new frontier. May be repeated if the topic is different. Repeatable.

SPST 526. Astronomical and Spacecraft Instrumentation. 3 Credits.
This course will concentrate on instrument design, operation, and the resulting data products generated by ground- and space-based astronomical observatories, as well as common instrumentation used in NASA scientific solar system spacecraft. Key goals for this course include gaining a solid understanding of instrumental principles of operation, the types of raw data that are generated, and the types of data reduction processes that lead to interpretable data. The course will include an investigation of different types of spectrographs and spectroscopy data products, solar instrumentation (ground- and space-based), terrestrial and Jovian spacecraft orbiter/flyby instrumentation, terrestrial planet rover and lander instrumentation, and extrasolar system astrophysical instrumentation. Students will have the opportunity to examine, reduce, and interpret select data sets. Prerequisites: SPST 425 and MATH 165 or consent of instructor. On demand.

SPST 527. Extraterrestrial Resources. 3 Credits.
This course focuses on the inventory, accessibility, acquisition, processing and utilization of extraterrestrial resources (space resources) from celestial bodies such as the Moon, Mars, asteroids and comets. Consideration will be given to extraterrestrial resources for in situ utilization (such as a Lunar or Martian base), for space operations (such as supporting large scale near-Earth activities or a human Mars mission), and for terrestrial markets. The course will focus on the interplay between the scientific, technical, and economic aspects of acquiring and utilizing such resources. The course will also explore some of the legal and political ramifications and limitations of claiming and recovering space resources. On demand.

SPST 528. Space Environment and the Sun. 3 Credits.
This course will provide an in-depth study of the science and observations of the Sun, space weather, and effects of the Sun on astronauts, Earth, and the space environment. Topics that will be covered include the solar photosphere and active surface phenomena such as sunspots, flares, and coronal mass ejections; the nature of the quiet Sun; the solar interior and helioseismology; space weather and impact of solar particles on the space environment and Earth; the hazards posed to astronauts by solar eruptions; common techniques of solar observations; and a review of the primary types of solar instrumentation and the observatories that currently study the Sun. Students will be able to observe the Sun using the UND Observatory's small solar telescopes; all students will have the opportunity to analyze solar datasets to aid their understanding of the Sun. Prerequisite: MATH 165 or consent of instructor. On demand.
SPST 540. Space Economics and Commerce. 3 Credits.
A study of the economic aspects of space activities, with analysis of the possibilities and the barriers. Key areas include launch services, satellite communications, remote sensing, microgravity materials processing, and interaction with the government. Global competition against subsidies or government-sponsored entities is examined. On demand.

SPST 541. Management of Space Enterprises. 3 Credits.
This course investigates the management of space organizations. These include organizations that are public and private, RD and operations, profit and non-profit. You will learn the basics of management theory, the history of systems management, and the technical issues that must be considered in the management of space RD and operations. On demand.

SPST 542. Risk Management of Space Organizations. 3 Credits.
This course includes a systematic approach to the principles and practices of risk management in the space industry from project initiation through planning, implementation, control and closeout. It discusses various techniques and models for qualitative and quantitative risk assessment and risk mitigation in such areas as cost, schedule, and performance. Decision making under conditions of uncertainty and risk is also discussed. On demand.

SPST 545. Space and the Environment. 3 Credits.
This course is an advanced graduate-level review of international relations theories as applied to the international implications of global commons. The course introduces the concept of global commons, examines the theories and practices concerning management of global commons, and analyzes the global commons dealing with the problems of collective action as applied to global environmental change and the use of outer space. On demand.

SPST 551. History of the Space Age. 3 Credits.
This course introduces students to the history of human endeavors in space. These include the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spaceflight.

SPST 552. History of Astronomy and Cosmology. 3 Credits.
This course investigates the history of human endeavors to understand the stars, planets, and cosmos as a whole from a scientific perspective. It covers the early observations and theories of the Babylonians and Greeks through the European Scientific Revolution, and finally to the development of astrophysics and modern cosmology using space vehicles. On demand.

SPST 555. Military Space Programs. 3 Credits.
An introduction to military uses of space by the United States, Russia, and other nations. The course introduces ballistic missiles, anti-ballistic missile and anti-satellite systems, space-based reconnaissance and intelligence-gathering, communications, navigation, acquisition, and military space treaties. On demand.

SPST 560. Space Politics and Policy. 3 Credits.
This course serves as a graduate-level introduction to the field of Public Policy as applied to Space Policy. The course surveys the evolution of Space Policy at several levels of analysis including context, political actors and institutions, political processes, and policy outcomes, and assesses the symbiotic relationship between policy, technology, and science. On demand.

SPST 561. Public Administration of Space Technology. 3 Credits.
This course is an advanced graduate-level review of Public Administration theories as applied to the implementation of space technology programs. In this course, the political, organizational, and technical variables that affect the management processes of space organizations are examined. Prerequisite: SPST 560 or SPST 541. On demand.

SPST 565. Space Law. 3 Credits.
This course serves as a graduate-level introduction to the field of Law as applied to Space Law. The course examines the origins and evolution of the laws of outer space from the beginnings of the space age to the present. International laws governing access and use of space, and national laws regulating governmental and commercial activities in space are reviewed and analyzed. On demand.

SPST 570. Advanced Topics in Space Studies. 1-3 Credits.
Lecture, discussion and readings on advanced topics of current interest. May be repeated if the topic is different. Repeatable.

SPST 574. Remote Sensing in Developing Countries. 3 Credits.
This course will introduce students to remote sensing programs in developing countries and typical remote sensing application areas pertinent to developing countries, such as: potable water, forest fires, vector diseases, environmental degradation, food security, fisheries, floods, droughts, crop pests, etc., with case studies. Prerequisite: SPST 522 or GEOG 475 or consent of instructor. On demand.

SPST 575. Remote Sensing Law and Policy. 3 Credits.
This course focuses on the evolving laws, policies, and institutions that have long-term ramifications for earth observations. Some topics addressed are the United Nations Principles on Remote Sensing; the United Kingdom's 1984 National remote sensing policy; the Montreal Protocol; and, the United States Land Remote Sensing Policy Act of 1992. Ground segment institutions considered are the Landsat Ground Stations Operations Working Group and the Global Land 1-KM AVHRR Project. Remote sensing litigation that has begun to address various applications of remote sensing will also be considered, and the impact of remote sensing activities on privacy and constitutional law will be examined. Cases include Dow vs US and EOSAT vs NASA and NOAA. On demand.

SPST 581. Field Visit to Space Centers. 1-3 Credits.
This course will provide a first-hand knowledge of selected space centers in the U.S. and/or abroad through an organized field visit. The field visit will be led by a space studies faculty and will include prior preparation through readings, class seminars, lectures and written assignments. May be repeated up to a maximum of 3 credits. Repeatable to 3 credits. S/U grading. On demand.

SPST 590. Space Studies Colloquium. 1 Credit.
A series of lectures presented by visiting lecturers and faculty. May be repeated for up to 2 credits. S/U grading.

SPST 591. Readings in Space Studies. 1-3 Credits.
Readings in selected Space Studies topics, with written and/or oral reports. Repeatable to a maximum of 6 credits. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPST 593. Individual Research in Space Studies. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits for Master's and up to 12 credits for Ph.D. Repeatable to 6 credits.

SPST 595. Space Studies Capstone. 3 Credits.
The capstone course integrates, extends and applies knowledge gained in earlier Space Studies courses and reading. The major component of this course is a collaborative team project inter-relating policy, technology and science. This course is required for distance students who select the non-thesis option and can be taken after completing at least 21 credits in the program, or with the permission of the instructor. The course begins in the fall semester and concludes with a required week-long capstone experience on the UND campus in the spring. Prerequisites: SPST 501 and SPST 502. F.

SPST 996. Continuing Enrollment. 1-12 Credits.
Prerequisite: Department consent. Repeatable. S/U grading.

SPST 997. Independent Study Report. 2 Credits.
Independent study and preparation of a written report for students taking the non-thesis option in the Master's program.

SPST 998. Thesis. 1-6 Credits.
An original research project approved by and completed under the supervision of a thesis committee. Repeatable to 6 credits. Prerequisites: Graduate standing in Space Studies and completion and approval of a thesis proposal (see department for approval). Repeatable to 6 credits.

SPST 999. Dissertation. 1-12 Credits.
An original research project approved by and completed under the supervision of a dissertation committee. Prerequisites: Graduate standing, approval, completion, and defense of dissertation proposal. Repeatable to 18 credits. F,S,SS.

Undergraduate Courses for Graduate Credit

SPST 405. Space Mission Design. 3 Credits.
A team design project to develop the requirements for a space mission. The specific mission will vary from time to time. Design teams will work on selected portions of the mission. Accompanying lectures will provide background material. Prerequisite: SPST 200. S.
SPST 410. Life Support Systems. 3 Credits.
A review of the physiological effects of living in space including a discussion of current and near-term life support systems equipment for the provision of oxygen, water, food, and radiation protection. In addition, a review will be made of the issues associated with the development of fully closed ecological life-support systems that will be essential to the long-term development of space. Prerequisite: SPST 200. On demand.

SPST 425. Observational Astronomy. 3 Credits.
This course provides an introduction to observational astronomy and includes three segments: basic observing techniques and astronomical equipment (telescopes, CCDs); visual observing and the characteristics of the night sky; astrometric and photometric observing, data reduction, and interpretations; and image processing and color imaging techniques. Students will learn to operate a remotely controllable Internet telescope and CCD camera. A broadband Internet connection is required. Night observing is required. Course fee. Prerequisite: PHYS 110. On demand.

SPST 430. Earth System Science. 3 Credits.
This course begins with a review of the physical sciences of geology, meteorology and oceanography to examine the coupled interactions between the land, atmosphere and oceans. Particular emphasis is placed on remote sensing techniques for global monitoring of biogeochemical processes. The role of human activities on Earth processes and the consequences of global environmental changes are discussed. The growing use of space-based data sets and the implications of Earth Observing System technologies, including research goals and hardware requirements, are examined. Prerequisite: SPST 200. On demand.

SPST 435. Global Change. 3 Credits.
The current human population represents something unprecedented in the history of the world. Never before has one species had such a great impact on the environment in such a short time and continued to increase at such a rapid rate. Human activities are therefore significantly influencing the Earth's environment in many ways in addition to greenhouse gas emissions and climate change. Anthropogenic changes to Earth's land surfaces, oceans, coasts, and atmosphere and to biological diversity, the water cycle, and biogeochemical cycles are clearly identifiable beyond natural variability. This course investigates the many facets of global change issues, and attempts to provide an up-to-date introduction to the study of the Earth's environment. F. even years.

SPST 450. International Space Programs. 3 Credits.
This course will introduce students to the major governmental space programs around the world. The history, activities and future directions of the Russian/Soviet, European/ESA, Chinese, Japanese, Indian and other space programs will be explored. International collaborations between the various programs will also be studied. Prerequisite: SPST 200. On demand.

SPST 460. Life in the Universe. 3 Credits.
This course examines the nature and evolution of life on Earth from its origin to the present time in the context of cosmological evolution, chemical evolution, planetary evolution, biological evolution, and cultural evolution. The possibility of life elsewhere in the universe is considered based on the conditions under which life could arise and flourish. Human changes to the Earth are placed within this context. The future of life on Earth is discussed and the social and cultural implications arising from the discovery of extraterrestrial life are explored. On demand.

Biochemistry and Molecular Biology

The Biochemistry & Molecular Biology program is no longer accepting applications.

Please go to the Biomedical Sciences page at:
http://und-public.courselife.com/graduateacademicinformation/
departmentalcoursesprograms/biomedicals/courses

The four graduate programs (Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, and Pharmacology, Physiology & Therapeutics) at the University of North Dakota School of Medicine and Health Sciences are now combined into an integrated, multi-disciplinary program in Biomedical Sciences. Students that entered the programs in fall 2014 will follow the newly developed curriculum and will become a part of the Biomedical Sciences graduate program. Students who enrolled in the four programs previous to fall 2014 will have the option of either completing degree requirements for the program in which they enrolled (found in previous UND Academic Catalogs) or transferring to and completing degree requirements for the Biomedical Sciences graduate program.

Biology

http://arts-sciences.und.edu/biology/graduate/programs.cfm

FACULTY: Boulanger, Carmichael, Darby, D. Darland, T. Darland, Ellis-Felege, Goodwin, Kelsch, Manu, Meberg (Chair), Newman (Graduate Director), Ovtchinnikov, Pyle, Ralph, Rhen, Sheridan, Simmons, Tkach, Vaughan and Yurkonis

Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Department of Biology offers graduate studies leading to the Master of Science (thesis and non-thesis options) and Doctor of Philosophy degrees. These programs are designed to prepare students for academic teaching and research, research in government service, research and developmental opportunities in industry, and functioning as a professional biologist.

The Department offers graduate work in the following areas: Cell Biology; Conservation Biology; Developmental Biology; Ecology; Entomology; Fisheries Biology; Genetics and Genomics; Molecular Biology; Neurobiology; Parasitology; Physiology; Plant Biology; Systematics; and Wildlife Management.

Facilities for Graduate Research

The Department of Biology occupies 58,000 sq. ft. in Starcher Hall. This structure houses classrooms, museums, offices, and research laboratories. There are three large rooftop greenhouses with an adjacent preparation area. The animal care facility includes rooms for aquatic organisms, aquatic bird rooms, observation rooms for behavioral study, and a number of rooms for holding small vertebrates. Other departmental research facilities include an herbarium, controlled environmental chambers, vertebrate and invertebrate research museums, plant and animal tissue culture rooms, data analysis facilities, and molecular biology laboratories. Notable recent departmental additions as part of a core Molecular Biology Facility include ultra- and high-speed centrifuges, Microm HM550 cryostat, Bio-Rad Experian microfluorics station, ABI and Bio-Rad real-time PCR systems, Bio-Rad Tetrad multi-block PCR thermocycler, automated DNA sequencer, UVP Autochemi gel documentation system, Nanodrop spectrophotometer, Fluoview Confocal Microscope, and Microbrightfield Instruments design-based stereology system. See the Biology Department webpage for a complete list of available equipment. Highly specialized instruments not presently available in Biology have been made available to our graduate students by other nearby facilities such as the Department of Chemistry and the Medical School.

The Department operates two field stations for research and class use. The Forest River Biology Area is 40 miles from campus and includes 160 acres consisting of spring brook, swamp, moist and dry woods and a section of the Forest River. The Oakville Prairie Field Station consists of approximately 1000 acres of virgin upland and lowland prairie located 12 miles from campus. Oakville Prairie offers rare native tall-grass prairie and saline seeps. Glacial Lake Agassiz receded from the site approximately 9,300 years ago, leaving a series of beach ridges. These ridges have mostly disappeared, but two of the Ojato Beach Ridges remain on the Oakville site along with 8 Saline Seeps (another geological feature not common elsewhere).

The Biology Department has a history of cooperative research involving the management of sport and commercial fisheries and wildlife with state (North Dakota Game and Fish Department, Minnesota Department of Natural Resources) and federal (US Fish and Wildlife Service, US Geological Survey, USDA Forest Service/National Grasslands, and National Park Service) agencies. Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.
Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Biology Graduate Program is to prepare our students well for careers in teaching and/or research in academics, government or industry, or for further graduate training. We strive for excellence in graduate education, mentorship and research across the breadth of biology, while focusing on strengths in vital sub-disciplines. We provide enriched, forward-looking graduate experiences in the areas of Ecology, Evolution, and Conservation Biology and Molecular, Cellular, and Developmental Biology. We strive to prepare students for the increasingly important integration of biological knowledge across levels of organization from molecules to the environment.

Goal 1: MS Students will demonstrate a broad knowledge and understanding of the major concepts of modern biology across all levels of biological organization from molecules to ecosystems, including the conceptual relationship among these levels of organization, and a deeper understanding of at least one sub-discipline of biology.

Goal 2: As students progress through the MS program at the University of North Dakota, they will exhibit an increasing ability to independently engage in the scientific process to both create and disseminate new knowledge. This will include the ability to:

1. Clearly and concisely propose a research project that incorporates the most recent body of knowledge in the discipline, critically analyzes accepted and emerging ideas in the discipline, and poses clear objectives and testable hypotheses along with appropriate methods and techniques for testing those hypotheses.

2. Demonstrate mastery of the technical skills necessary for making observations, gathering and analyzing data, and testing hypotheses in the particular sub-discipline.

3. Synthesize information and communicate the results of their research clearly and effectively in oral, written and visual form, including publication in peer-reviewed outlets and presentation at professional meetings.

Goal 3: Students will develop and display an understanding of professional ethics in the conduct of research, teaching, and service as scientists.

Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals

The mission of the Biology Graduate Program is to prepare our students well for careers in teaching and/or research in academics, government or industry. We strive for excellence in graduate education, mentorship and research across the breadth of biology, while focusing on strengths in vital sub-disciplines. We provide enriched, forward-looking graduate experiences in the areas of Ecology, Evolution, and Conservation Biology and Molecular, Cellular, and Developmental Biology. We strive to prepare students for the increasingly important integration of biological knowledge across levels of organization from molecules to the environment.

Goal 1. Ph.D. students will demonstrate a broad knowledge and understanding of the major concepts of modern biology across all levels of biological organization from molecules to ecosystems, including the conceptual relationship among these levels of organization, and exhibit substantial depth of knowledge and ability to evaluate and communicate relevant theories, controversies, and unanswered questions in at least one sub-discipline of biology.

Goal 2. As students progress through the PhD program at the University of North Dakota, they will exhibit an increasing ability to independently engage in the scientific process to both create and disseminate new knowledge. This will include the ability to:

1. Clearly and concisely propose a research project that incorporates the most recent body of knowledge in the discipline, critically analyzes accepted and emerging ideas in the discipline, and poses clear objectives and testable hypotheses along with appropriate methods and techniques for testing those hypotheses.

2. Demonstrate mastery of the technical skills necessary for making observations, gathering and analyzing data, and testing hypotheses in the particular sub-discipline.

3. Synthesize information and communicate the results of their research clearly and effectively in oral, written and visual form, including publication in peer-reviewed outlets and presentation at professional meetings.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biology Department. The Master of Science degree program is designed to produce broadly trained biologists for job opportunities or continued graduate study.

Thesis Option

The M.S. degree program with thesis requires the completion of a program of study of at least 30 semester credits beyond the baccalaureate degree. The program of study, prepared with the approval of a three-member faculty advisor committee, includes the following:

1. A minimum of 30 credits including coursework, research and thesis accounting for no more than 50% of credits.

2. A minimum of three (3) credits of BIOL 503 Seminar (credits included in 1. above).

3. A minimum of four (4) credits of BIOL 509 Scientific Writing, (credits included in 1. above). Two credits should be taken while the student is writing their thesis proposal (see below).

4. Either:
   a. BIOL 470 Biometry (3 credits) and one of BIOL 572 Design of Biological Experiments (1 credit) or BIOL 544 Quantitative Ecology (3 credits) (all credits included in 1. above); or
   b. prior graduate credit in statistical analysis and experimental design if approved by the student’s advisory committee.
5. Satisfactory completion of an acceptable thesis proposal (written proposal, presentation, and defense) evaluated by the student’s advisory committee.
6. Satisfactory completion of a comprehensive examination administered by the student’s advisory committee; and
7. Satisfactory completion of an acceptable thesis (written thesis, seminar, and defense) evaluated by the student’s advisory committee.

Non-Thesis Option
This degree program is designed for students who wish to obtain broad training in graduate biology without research emphasis. The M.S. non-thesis degree program requires the completion of a program of study of at least 32 semester credits beyond the baccalaureate degree. The program of study prepared with the approval of a faculty supervisor, includes the following:

1. At minimum of 32 credits of coursework.
2. A minimum of three (3) credits of BIOL 503 Seminar (credits included in 1. above).
3. A minimum of 23 credits in the major (credits included in 1. above).
4. BIOL 599 Research and BIOL 998 Thesis credits will not count toward the 32 credits.
5. Satisfactory completion of a comprehensive examination administered by the student’s advisor and two other faculty members selected by the student with the concurrence of the advisor, the faculty members involved and the department chairperson.
6. Satisfactory completion of an acceptable Independent Study. The Independent Study should be substantial and rigorous and involve a written report and a formal oral presentation to the Department.

Doctor of Philosophy (Ph.D.)
Admission Requirements
1. Must meet current minimum general requirements as published by the School of Graduate Studies.
2. May enter the program with a Master’s degree or directly with a Bachelor’s degree.
3. All applicants seeking admission to the biology graduate program must provide GRE General test scores. Strength of scores will be considered regarding admission and awarding of departmental support.
4. Minimum GPA of 3.0 for the Master’s degree work. If applying with only an undergraduate degree, must have a minimum GPA of 2.75 for all undergraduate work or 3.0 for junior – senior credits.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Financial Assistance
Financial aid in the form of teaching assistantships, research assistantships, fellowships and internships are available on a competitive basis. Students seeking teaching assistantships should complete their applications by February 15, since most offers for appointments are made beginning in early March. Teaching assistantships are renewable if progress toward the degree and instructional service are satisfactory. Research assistantships may be offered by faculty members for work on specific research projects for nine or twelve month periods.

Degree Requirements
Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biology Department.

The Ph.D. degree program requires the completion of a program of study of at least 90 semester credits beyond the baccalaureate degree. The program of study, prepared with the approval of a five-member faculty advisory committee, includes the following:

1. A major area of a minimum 90 credits including coursework, research and dissertation structured at the committee’s discretion but with a minimum of 18 semester credits of course work. Work completed in a master’s program may be incorporated into the doctoral program if approved by the student’s advisory committee.
2. A minor is not required, but each student is expected to show competence in related areas as determined by the student’s faculty advisory committee.
3. A minimum of five (5) credits on BIOL 503 Seminar (included in 1. above).
4. A minimum of four (4) credits of BIOL 509 Scientific Writing (credits included in 1. above). Two credits should be taken while the student is writing their thesis proposal (see below). Two credits can be waived at the discretion of the student’s advisory committee for students with a well-written Master’s thesis and at least one first-authored publication in press.
5. Either:
   a. BIOL 470 Biometry (3 credits) and one of BIOL 572 Design of Biological Experiments (1 credit) or BIOL 534 Quantitative Ecology (3 credits) (all credits included in 1. above); or
   b. prior graduate credit in statistical analysis and experimental design if approved by the student’s advisory committee.
6. Two scholarly tools. The nature of the scholarly tools shall be determined based upon their importance to the student’s field of research as determined by the student’s advisory committee.
7. Satisfactory completion of an acceptable dissertation proposal (written proposal, proposal presentation and proposal defense) evaluated by the student’s advisory committee.
8. Satisfactory completion of a comprehensive examination administered by the student’s advisory committee.

Courses
BIOL 503. Seminar. 1 Credit.
Discussion of selected topics in advanced biology, a different topic each semester. Repeatable to 6 credits.

BIOL 505A. Biological Inquiry for Teachers. 3 Credits.
First of general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include energy conversion, cell and molecular biology, genetics, physiology, evolution, ecology, and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 505L. On demand.

BIOL 505B. Biological Inquiry for Teachers. 3 Credits.
Second of a general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include energy conversion, cell and molecular biology, genetics, physiology, evolution, ecology, and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 505A.

BIOL 505L. Biological Inquiry for Teachers Laboratory. 2 Credits.
This hands-on lab course complements Biol 505 and is intended for teachers planning to enrich their practical skills in biology for professional development. May not be used in Ph.D. or Master’s programs. Prerequisite: Must be licensed k-12 teacher.

BIOL 506A. Ecology for Teachers. 3 Credits.
Second of a general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include physiological ecology, behavioral ecology, population ecology, community ecology, landscape ecology, geographical ecology, global ecology and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 506L.

BIOL 506B. Ecology for Teachers. 3 Credits.
Second of a general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include physiological ecology, behavioral ecology, population ecology, community ecology, landscape ecology, geographical ecology, global ecology and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 506A.
BIOL 506L. Ecology for Teachers Laboratory. 2 Credits.
This hands-on lab course complements Biol 506 and is intended for teachers planning to enrich their practical skills in biology for professional development. May not be used in Ph.D. or Master’s programs. Prerequisites: BIOL 505L and BIOL 505B.

BIOL 507A. Cellular and Molecular Biology for Teachers. 3 Credits.
Third of a general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include cell, molecular, developmental and evolutionary biology. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 507L.

BIOL 507B. Cellular and Molecular Biology for Teachers. 3 Credits.
Third of a general biology course sequence intended for teachers planning to qualify to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include cell, molecular, developmental and evolutionary biology. May not be used in Ph.D. or Master’s programs. Prerequisite: BIOL 507A.

BIOL 507L. Cellular and Molecular Biology for Teachers Laboratory. 2 Credits.
This hand-on lab course complements Biol 507 and is intended for teachers planning to enrich their practical skills in biology for professional development. May not be used in Ph.D. or Master’s programs. Prerequisite: Must be licensed K-12 teacher.

BIOL 509. Scientific Writing. 2 Credits.
Writing is an essential part of the scientific enterprise. In this course, students will develop their scientific writing skill through readings and discussion on the nature of effective writing, and through critique of writing projects produced by each student. Course can be repeated up to 4 credits for different writing projects. Prerequisite: Consent of instructor. Repeatable to 4 credits. F.

BIOL 512. Advanced Evolutionary Analysis. 2 Credits.
This course will focus on methods that reconstruct evolutionary histories of populations, species and higher-level taxa. The course will also discuss the evolution of specialized traits using appropriate analyses. Prerequisite: Consent of instructor. On demand.

BIOL 533. Grassland Ecology. 2 Credits.
Phytogeography, environmental influences, and community dynamics of grassland ecosystems with emphasis on herbage production, ecosystem modeling, and ecological characteristics of major grass species. Prerequisite: BIOL 332 or an equivalent approved by the department.

BIOL 534. Quantitative Ecology. 3 Credits.
An introduction to the methods employed in the study of the ecology of natural populations/communities of plants and animals.

BIOL 535. Physiological Ecology. 3 Credits.
Critical evaluation and synthesis of selected theoretical topics in physiological ecology. Prerequisite: BIOL 442 or consent of instructor. On demand.

BIOL 536. Advanced Population Biology. 3 Credits.
In this course we will examine current thinking on a range of topics in population ecology, population genetics and the links between ecological and evolutionary dynamics. Students will build on background reading by developing their own models of some aspect of population biology (ecological and/or genetic). Prerequisite: Consent of instructor. S, even years.

BIOL 571. Advanced Biometry. 3 Credits.
Advanced topics in the analysis of biological data using statistical software. Prerequisite: An introductory course in statistics.

BIOL 572. Design of Biological Experiments. 1 Credit.
Topics in designing biological experiments including the role of experimentation, inference, sampling, replication, controls, and power analysis. Corequisite: BIOL 470 or consent of instructor. F.

BIOL 590. Special Topics. 1-4 Credits.
Important and current topics in biology not covered by other courses. Repeatable when topics vary. Examples include: Aquaculture, Big Game Biology, Biorehythms, Conservation Biology, Fire Ecology, Molecular Techniques, Plant-Animal Interactions, Sex Determination and Speciation. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable.

BIOL 592. Directed Studies. 1-4 Credits.
Designed to meet the needs of individual and small groups of students in areas of faculty specialization. May be repeated to a total of 12 credits. Repeatable to 12 credits.

BIOL 593. Advanced Topics in Plant Biology. 1-4 Credits.
Advanced topics in plant biology. Examples include: Plant Development, Plant Biochemistry, and Plant Genetics. Repeatable when topics vary. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable. On demand.

BIOL 594. Advanced Topics in Genetics. 1-4 Credits.
Advanced topics in genetics. Examples include: Biochemical Genetics, Cytogenetics, and Human Medical and Population Genetics. Repeatable when topics vary. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable. On demand.

BIOL 595. Advanced Topics in Fisheries, Wildlife, and Conservation. 1-4 Credits.
Advanced topics in fisheries, wildlife or conservation biology. Examples include: Natural Resource Policy, Waterfowl Biology and Management, and Wetland and Prairie Ecology. Repeatable when topics vary. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable. On demand.

BIOL 596. Advanced Topics in Parasitology. 1-4 Credits.
Advanced topics in parasitology. Examples include: Arthropod Borne Diseases, Helminthology, Disease Biology, and Medically Important Arthropods. Repeatable when topics vary. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable. On demand.

BIOL 597. Advanced Topics in Physiology and Development. 1-4 Credits.
Advanced topics in physiology and development. Examples include: Comparative Endocrinology, Vascular Development, Embryonic Physiology, and Neural Physiology. Repeatable when topics vary. Prerequisite: Graduate status or upper division status with consent of instructor. Repeatable. On demand.

BIOL 599. Research. 1-15 Credits.
Intended for students conducting original research in consultation with staff. Repeatable. S/U grading.

BIOL 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

BIOL 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

BIOL 998. Thesis. 1-9 Credits.
Repeatable to 15 credits.

Undergraduate Courses for Graduate Credit

BIOL 312. Evolution. 3 Credits.
A study of the processes that have led from the origin of life to the diverse patterns and forms of life observable today. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S.

BIOL 315. Genetics. 3 Credits.
An introduction to genetics, with emphasis on classical genetic analysis and the biochemistry of gene transmission, expression and regulation. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F.

BIOL 332. General Ecology. 3 Credits.
An introduction to ecology. Covers the relationship of individuals, populations, communities and ecosystems to their biotic and abiotic environments. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F.

BIOL 332L. Gen Ecology Lab. 1 Credit.
Field projects and laboratory exercises to complement BIOL 332. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Prerequisite or Corequisite: BIOL 332. F.

BIOL 333. Population Biology. 3 Credits.
Principles of population genetics, population ecology, and evolution in plants and animals. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and MATH 97 or higher. S.

BIOL 336. Systematic Botany. 4 Credits.
Morphology, evolution, and classification of vascular plants with emphasis on the flora of the Great Plains. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or permission of instructor. F, even years.
Biology

BIOL 338. Animal Behavior. 2 Credits.
Studies in animal social behavior. The influences of environmental factors on behavior is emphasized. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L or an equivalent approved by the department. S, even years.

BIOL 341. Cell Biology. 3 Credits.
Description of processes common to life at the cellular level including: biochemical and structural organization, membrane function, motility, signal transduction, growth, division and genetic regulation of the cell. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L. Prerequisite or Corequisite: CHEM 122. S.

BIOL 341L. Cell Biol Lab. 1 Credit.
Laboratory investigation utilizing techniques to study life at the cellular level including chemical composition and characterization, enzyme kinetics, metabolism and microscopy. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L. Prerequisites or Corequisites: BIOL 341L, CHEM 122. S.

BIOL 350. Plant Biology. 3 Credits.
Structure and function of plants at the cellular, tissue, and whole plant levels. Topics also include ecological adaptations and plant-derived products. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or permission of instructor. S, odd years.

BIOL 363. Entomology. 4 Credits.
Structure, functions, life history, classification, habits and distribution of insects. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F, even years.

BIOL 364. Parasitology. 2 Credits.
Classification, structure, functions, and life-cycles of parasites having importance to human, wildlife and veterinary health. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Prerequisite or Corequisite: BIOL 364. F, odd years.

BIOL 364L. Parasitology Laboratory. 2 Credits.
A basic parasitology laboratory to complement BIOL 364. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F, even years.

BIOL 369. Histology. 2 Credits.
Microscopical anatomy of vertebrate tissues and organs, with emphasis on man and other mammals. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S.

BIOL 369L. Histology Lab. 2 Credits.
A basic histology laboratory to complement BIOL 369. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. Prerequisite or Corequisite: BIOL 369L. S.

BIOL 376. Animal Biology. 3 Credits.
Evolution, morpho-anatomy, development, reproduction and other aspects of the natural history of invertebrate and vertebrate animals. Prerequisites: BIOL 150 and BIOL 151. S.

BIOL 376. Developmental Biology. 3 Credits.
An overview of general stages and mechanisms of development, experimental approaches used to study developmental processes, and genetic and environmental influences that govern development. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, BIOL 315 and BIOL 341. F.

BIOL 410. Molecular Biology Techniques. 4 Credits.
Applications of DNA and RNA analysis and recombinant DNA technologies, emphasizing practical experience in the laboratory. This class will meet twice a week for 50 minutes in the classroom, and students will be expected to work approximately 4-6 hours a week in the lab during open lab times. Counts as an upper-division laboratory course. Prerequisite: BIOL 315 is recommended. F.S.

BIOL 415. Genomics. 4 Credits.
Genomics describes the determination of the complete nucleotide sequence of an organism and subsequent analyses to decode the structural and functional information of all genes and regulatory sequences in the genome. This four-credit course will consist of lectures, computer lab sessions, in-class exercises, take-home assignments, student presentations, and discussion of research articles. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L and BIOL 315. S.

BIOL 425. Ichthyology. 3 Credits.
Structure and function, anatomy, physiology, behavior, classification, distribution and ecologic aspects of fishes. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F, even years.

BIOL 426. Birds & Mammals. 4 Credits.
Birds and Mammals is designed to familiarize students with avian and mammalian biology, including anatomy and physiology, behavior, ecology, evolution and conservation. Lab exercises will be integrated with lecture to emphasize taxonomy and identification. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. S.

BIOL 430. Human Dimensions of Wildlife and Fisheries. 3 Credits.
This course explores interactions among humans and fisheries and wildlife resources, with a focus on principles important for understanding and addressing wildlife management. Topics will include public attitudes, expectations and diverse values of fisheries and wildlife resources; stakeholder engagement; public relations; governance; philosophy and ethics of resource use and management; and human dimensions research methodology. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. S, odd years.

BIOL 431. Wildlife Management. 4 Credits.
Theory and methods of management of wildlife populations. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. F, odd years.

BIOL 432. Techniques in Wildlife Population Assessment. 4 Credits.
Techniques in Wildlife Population Assessment is a course designed to teach wildlife biology students the techniques used to assess wildlife populations for conservation and management. Students learn the appropriate situations to use the techniques, how to properly conduct the procedures, how to collect data from the use of these techniques, and how to report the findings to a variety of audiences. The structure of the course is designed to teach students proper research methodology so that they not only know how and when to use the techniques, but also how they can apply their findings to make appropriate management recommendations for wildlife conservation and management under a variety of settings or conditions. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. F, even years.

BIOL 433. Aquatic Ecology. 3 Credits.
Analysis of the relationships between organisms and their physical, chemical and biological environments in freshwater ecosystems. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S, odd years.

BIOL 435. Large Mammal Ecology and Management. 3 Credits.
A course covering details of the population ecology, specialized management approaches and techniques, and conservation of large-bodied mammals in North America and worldwide. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or an equivalent approved by the department. S, odd years.

BIOL 438. Fisheries Management. 3 Credits.
Concepts and approaches to the management of freshwater fisheries. Course will include discussion of life histories and requirements of important regional sport fishes. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or instructor permission. S, even years.

BIOL 439. Conservation Biology. 3 Credits.
A course that integrates information from the disciplines of ecology, genetics, biogeography, economics, environmental policy, and ethics towards understanding how to maintain and restore biological diversity. F, odd years.

BIOL 442. Physiology of Organs and Systems. 3 Credits.
Study of the physiology of organs and organ systems in vertebrates. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and Junior or Senior standing or an equivalent approved by the department. F.

BIOL 442L. Physiology of Organs and Systems Laboratory. 1 Credit.
A physiology laboratory to complement BIOL 442. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or and equivalent approved by the department. Prerequisite or Corequisite: BIOL 442. F.
BIOL 450. Molecular Genetics, 2 Credits.
Topics will include basic molecular genetic mechanisms, recombinant DNA technology, the organization and function of the cell nucleus, and the molecular control of gene expression. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L, and BIOL 315 or equivalent approved by the department. On demand.

BIOL 470. Biometry. 4 Credits.
Analysis of biological data. Covers descriptive statistics, inferential statistics (e.g., t-tests, goodness-of-fit tests, regression, ANOVA and non-parametric tests), and interpreting and presenting statistical results. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L or equivalent approved by the department. F.

Biomedical Sciences

http://www.med.und.edu/basic-sciences/

FACTORY: Bradley, Brissette, Brown-Borg, Carr, Carvelli, Chen, Combs (Department Chair), Condry, Dhasarathy, Doze, Dunlevy, Foster, Geiger, Ghribi, Golovko, Grove, Haselton, Henry, Hur, Kob, Lei, Milavetz, Mishra, Mukundan, Murphy, Nechaev, Nilles, Nookala, Porter, Rosenberger (Program Director), Ruit, Shabb, Sharma, Singh, Sukalski, Tessema, Vaughan, Watt, Wu

JOINT FACTORY: Basson

Degrees Granted: Master of Science (M.S.), Doctor of Philosophy (Ph.D.), and Combined M.D./Ph.D.

The Department of Biomedical Sciences offers graduate programs leading to the M.S. and Ph.D. degrees, including the combined M.D./Ph.D degree. All programs are research-oriented and students begin research work during their first year. These graduate degree programs prepare scholars for a variety of careers including academic teaching, research, and related careers in various governmental, industrial, and private research laboratories. Research and educational opportunities within the program provide students with focused training in multiple fields including inflammation and infectious disease, neuroscience and neurodegenerative disease, epigenetics, and molecular and cellular biology.

Master of Science (M.S.)

Mission Statement and Program Goals
The mission of the Biomedical Sciences Graduate Program leading to the Master of Science degree is to prepare students for careers in education or technical careers in biomedical sciences.

Goal 1: M.S. graduates will possess and be capable of applying knowledge in biomedical sciences related to their field of study.

Objective 1.1: Students will demonstrate a breadth of knowledge in the biomedical sciences to support scholarly inquiry and flexibility in their career path.

Objective 1.2: Students will demonstrate a depth of knowledge in elected subject areas through scholarly contribution to their field of study.

Objective 1.3: Students will demonstrate skills in the use of technology to manage information.

Objective 1.4: Students will demonstrate the ability to use primary literature and other resources to support their scholarly efforts.

Goal 2: M.S. graduates will demonstrate the ability to understand, develop, and apply multiple approaches to test ideas using the scientific method.

Objective 2.1: Students will be able to apply the scientific method to conduct a scholarly investigation.

Objective 2.2: Students will demonstrate an ability to formulate questions and generate hypotheses in response to new and unfamiliar problems.

Objective 2.3: Students will demonstrate an ability to implement experimental approaches that have been appropriately chosen to test their hypotheses.

Objective 2.4: Students will demonstrate the ability to appropriately and accurately collect, record, and analyze research data.

Objective 2.5: Students will demonstrate the ability to reach scientifically sound conclusions based on current knowledge within their field of study.

Goal 3: M.S. graduates will master communication skills necessary to convey the results of their scholarly work.

Objective 3.1: Students will demonstrate the ability to present their research clearly, concisely, and accurately in both oral and written form to experts in the field and to the general scientific community.

Objective 3.2: Students will demonstrate the ability to effectively communicate their scholarly work to a lay audience in a way that illustrates the accomplishments and importance of scientific research.

Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals
The mission of the Biomedical Sciences Graduate Program leading to the Doctor of Philosophy degree is to prepare students for professional careers in biomedical sciences through personalized and multi-disciplinary graduate education and research experiences.

Goal 1: Ph.D. graduates will become professionals who possess a foundational knowledge of the biomedical sciences and are capable of applying that knowledge in scholarly endeavors as self-directed, life-long learners.

Objective 1.1: Students will demonstrate breadth of knowledge in the biomedical sciences to form a solid basis for scholarly inquiry and flexibility in their career path.

Objective 1.2: Students will demonstrate depth and integration of knowledge in specific subject areas of their choice to support their research and to allow them to make meaningful contributions that advance the discipline.

Objective 1.3: Students will demonstrate skills in managing information and searching the biomedical literature and data repositories using appropriate technology.

Objective 1.4: Students will remain current in their knowledge of major scientific developments and apply this knowledge to multi-disciplinary problems.

Goal 2: Ph.D. graduates will become professionals who demonstrate intellectual curiosity and the ability to conduct meaningful scholarly inquiry.

Objective 2.1: Students will demonstrate the ability to develop clearly stated meaningful hypotheses and research questions that lead to scientific investigation in areas relevant to the biomedical sciences.

Objective 2.2: Students will demonstrate the ability to select, design, and implement experimental approaches to rigorously test their hypotheses.

Objective 2.3: Students will demonstrate the ability to appropriately and accurately record and to analyze data with the degree of rigor expected by the scientific community.

Objective 2.4: Students will demonstrate the ability to reach scientifically sound conclusions by integrating their data with existing knowledge and by critical evaluation of their results.

Objective 2.5: Students will disseminate their findings through peer-reviewed publications and other means that advance knowledge in their discipline.

Goal 3: Ph.D. graduates will master communication skills necessary to convey the results of their scholarly work.
Objective 3.1: Students will demonstrate the ability to present their research clearly, concisely, and accurately in both oral and written form to experts in the field and to the general scientific community.

Objective 3.2: Students will demonstrate the ability to effectively communicate their scholarly work to a lay audience in a way that illustrates the accomplishments and importance of scientific research.

Goal 4: Ph.D. graduates will gain experience in education and mentorship.

Objective 4.1: Students will demonstrate the ability to teach biomedical science to a precollege, undergraduate, graduate, or health professional audience.

Objective 4.2: Students will demonstrate the ability to provide formative and summative feedback that encourages, assesses, and improves learning.

Objective 4.3: Students will demonstrate the principles of effective mentorship.

Goal 5: Ph.D. graduates will recognize and abide by professional and ethical standards and participate in service to their institution, the scientific community, and society in general.

Objective 5.1: Students will demonstrate the ability to establish rapport with colleagues and peers that encourages a team-based mindset toward the accomplishment of departmental and institutional goals.

Objective 5.2: Students will demonstrate the ability to articulate and abide by the standards of ethical behavior and responsible conduct in research.

Objective 5.3: Students will demonstrate the ability to articulate and abide by the acceptable standards of conduct in the teacher-learner relationship.

Objective 5.4: Students will engage in on-going service to the department, the school, the university, the profession, and the community.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Completion of a four-year Bachelor’s degree or equivalent from a recognized college or university as described in the UND Undergraduate and Graduate Academic Catalog. Exceptions must be approved by the Dean of the School of Graduate Studies.

2. Coursework: Admission into the Biomedical Sciences Graduate Program is dependent upon the applicant’s demonstration of effective academic skills and appropriate undergraduate training. Ideally, the applicant will have completed the following coursework:
   - General Biology with laboratory
   - General Chemistry with laboratory
   - Organic Chemistry with laboratory
   - Physics with laboratory
   - Biochemistry or equivalent
   - Calculus
   - Advanced undergraduate coursework in at least one of the following areas: molecular biology, cell/developmental biology, genetics, neuroscience, biochemistry, microbiology, immunology, anatomy, or physiology.

3. Applicants must have a cumulative undergraduate GPA of at least 3.0/4.0. Applicants with previous graduate education should have a cumulative GPA of 3.5/4.0 in their graduate level coursework. Graduate Record Examination scores: Applicants must submit Graduate Record Examination scores. The General test is required; the Subject test is strongly recommended. The Biochemistry, Cell and Molecular Biology, Biology, or Chemistry subject tests are acceptable. Preference for admission will be given to applicants whose averaged test scores are at or above the 50th percentile.

4. International applicants must satisfy the School of Graduate Studies English Language Proficiency Requirements.

5. A Statement of Goals must be included with the application materials. This statement will describe the student’s academic achievements, research experience and accomplishments, career goals, and objectives for applying to the Biomedical Sciences Graduate Program.

6. Three letters of recommendation addressing the student’s academic performance and research or professional experience are required to complete the application. At least two letters must be from faculty having direct knowledge of the student’s academic capabilities.

7. Preference will be given to students who can demonstrate undergraduate research and/or a record of scholarly publication or other relevant experience.

Degree Requirements

Students seeking the Master of Science degree in the Biomedical Sciences Graduate Program must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biomedical Sciences Graduate Program. In addition to course work, the M.S. degree requires completion of an acceptable thesis in a program of study designed by the student with Faculty Advisory Committee approval.

1. A minimum of 30 credit hours of graduate level courses including research and thesis.

2. Completion of the following core graduate courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIMD 501</td>
<td>Scientific Discovery I</td>
<td>6</td>
</tr>
<tr>
<td>BIMD 510</td>
<td>Basic Biomedical Statistics (fulfills the scholarly tool requirement)</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 516</td>
<td>Responsible Conduct of Research</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 590</td>
<td>Research</td>
<td>at least 8</td>
</tr>
<tr>
<td>BIMD 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
</tbody>
</table>

3. Completion of a minimum of 4 credit hours of graduate level elective courses selected from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 513</td>
<td>Gross Anatomy</td>
<td>6</td>
</tr>
<tr>
<td>ANAT 517</td>
<td>Principles of Histology</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 521</td>
<td>Principles of Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 522</td>
<td>Neuroscience</td>
<td>6</td>
</tr>
<tr>
<td>ANAT 591</td>
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<td>BMB 533</td>
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<tr>
<td>MBIO 501</td>
<td>Molecular Virology</td>
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<td>MBIO 504</td>
<td>Microbial Physiology</td>
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<td>MBIO 508</td>
<td>Microbial Pathogenesis</td>
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<td>MBIO 509</td>
<td>Immunology</td>
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<td>MBIO 512</td>
<td>Microbial Genetics</td>
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<td>MBIO 515</td>
<td>Advanced Topics</td>
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<tr>
<td>MBIO 519</td>
<td>Advanced Immunology</td>
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<tr>
<td>PPT 500</td>
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<td>PPT 503</td>
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<td>PPT 511</td>
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<td>Advanced Renal Physiology</td>
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<td>PPT 527</td>
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<td>PPT 529</td>
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BIMD 522 Principles of Neuropharmacology 2
BIMD 523 Neurochemical Basis of the Nervous System 2
BIMD 524 Neurodegenerative Diseases and Pathophysiology 2
BIMD 530 Components of the Immune System 2
BIMD 531 Components of Microbial Pathogenesis 2
BIMD 532 Microbial Gene Regulation 1
BIMD 533 Microbial Membranes and Transport 1
BIMD 534 Microbial Cell Structure and Function 1
BIMD 535 Bacterial Host: Pathogen Interactions 1
BIMD 536 Molecular Biology and Pathogenesis of Viruses 1
BIMD 537 Host-Pathogen Interactions involving Eukaryotic Microbes (Parasites/Fungi) 1
BIMD 538 Immunological Disorders 1

4. A student must obtain at least a “B” in all required courses in order to remain in good standing in the graduate program. If less than a “B” is received, the student will be given the opportunity to remediate in a manner determined by the course director. If remediation is unsuccessful, the student may petition the Graduate Faculty to take the course a second time. In the event that the student is unable to raise the grade to at least a “B”, the student must petition the Graduate Faculty to be allowed to remain the program.

5. Students must maintain a minimum 3.0 GPA in accordance with School of Graduate Studies guidelines (UND Graduate and Undergraduate Academic Catalog).

6. In addition to course work, the Master of Science degree requires completion of a thesis-based scholarly project completed by the graduate student under the guidance of a faculty advisor. It is expected that the results of the scholarly work will be publishable in a peer-reviewed journal.

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Completion of a four-year Bachelor’s degree or equivalent from a recognized college or university as described in the UND Undergraduate and Graduate Academic Catalog. Exceptions must be approved by the Dean of the School of Graduate Studies.

2. Coursework: Admission into the Biomedical Sciences Graduate Program is dependent upon the applicant’s demonstration of effective academic skills and appropriate undergraduate training. Ideally, the applicant will have completed the following coursework:

   - General Biology with laboratory
   - General Chemistry with laboratory
   - Organic Chemistry with laboratory
   - Physics with laboratory
   - Biochemistry or equivalent
   - Calculus
   - Advanced undergraduate coursework in at least one of the following areas: molecular biology, cell/developmental biology, genetics, neuroscience, biochemistry, microbiology, immunology, anatomy, or physiology.

3. Applicants must have a cumulative undergraduate GPA of at least 3.0/4.0. Applicants with previous graduate education should have a cumulative GPA of 3.5/4.0 in their graduate level coursework.

4. Graduate Record Examination scores: Applicants must submit Graduate Record Examination scores. The General test is required; the Subject test is strongly recommended. The Biochemistry, Cell and Molecular Biology, Biology, or Chemistry subject tests are acceptable. Preference for admission will be given to applicants whose averaged test scores are at or above the 50th percentile.

5. International applicants must satisfy the School of Graduate Studies English Language Proficiency Requirements.

6. A Statement of Goals must be included with the application materials. This statement will describe the student’s academic achievements, research experience and accomplishments, career goals, and objectives for applying to the Biomedical Sciences Graduate Program.

7. Three letters of recommendation addressing the student’s academic performance and research or professional experience are required to complete the application. At least two letters must be from faculty having direct knowledge of the student’s academic capabilities.

8. Preference will be given to students who can demonstrate undergraduate research and/or a record of scholarly publication or other relevant experience.

Degree Requirements

Students seeking the Ph.D. degree in the Biomedical Sciences Graduate Program must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biomedical Sciences Graduate Program. In addition to course work, the Ph.D. degree requires completion of an acceptable dissertation in a program of study designed by the student with Faculty Advisory Committee approval.

1. A minimum of 90 credit hours of graduate level courses including research and dissertation.

2. Completion of the following graduate level courses:

   - BIMD 501 Scientific Discovery I 6
   - BIMD 502 Scientific Discovery II 6
   - BIMD 510 Basic Biomedical Statistics (fulfills the scholarly tool requirement) 2
   - BIMD 516 Responsible Conduct of Research 2
   - BIMD 518 Grant Writing 2
   - BIMD 590 Research at least 50
   - BIMD 999 Dissertation 6

3. The optional transcriptable subplan (Specialization) in Neuroscience requires completion of the following 5 courses (10 credits):

   - BIMD 520 Principles of Neuroanatomy 2
   - BIMD 521 Neurophysiology 2
   - BIMD 522 Principles of Neuropharmacology 2
   - BIMD 523 Neurochemical Basis of the Nervous System 2
   - BIMD 524 Neurodegenerative Diseases and Pathophysiology 2

4. The optional transcriptable subplan (Specialization) in Microbiology and Immunology requires completion of the following 2 courses (4 credits):

   - BIMD 530 Components of the Immune System 2
   - BIMD 531 Components of Microbial Pathogenesis 2

   and also requires completion of 5 credits chosen from the following courses:

   - BIMD 532 Microbial Gene Regulation 1
   - BIMD 533 Microbial Membranes and Transport 1
   - BIMD 534 Microbial Cell Structure and Function 1
   - BIMD 535 Bacterial Host: Pathogen Interactions 1
   - BIMD 536 Molecular Biology and Pathogenesis of Viruses 1
   - BIMD 537 Host-Pathogen Interactions involving Eukaryotic Microbes (Parasites/Fungi) 1
   - BIMD 538 Immunological Disorders 1

5. Students who choose not to complete a subplan must complete a minimum of 6 credit hours of graduate level elective courses selected from the following:
Students are expected to complete the following general requirements for the Ph.D. degree in a medical science field:

1. Performance of original research of a quality suitable for publication in refereed, professional journals.
2. Pass final examination which includes preparation and oral defense of a satisfactory dissertation.
3. Completion of.
4. A minimum of 90 credit hours, including research and dissertation.
5. Successful completion of a scholarly tool (Note: May be specified by a department.)
6. Completion of the first two years of the medical education curriculum, transferred as 44 credits toward the Ph.D.

**ANAT Courses**

**ANAT 501. Biomedical Information Retrieval. 1 Credit.**

This course integrates electron information retrieval techniques with biomedical research education to develop the student's ability to augment traditional learning and research. Electronic techniques covered include data base searching and internet resources. S/U grading. F,S,SS.

**ANAT 505. Seminar in Anatomy and Cell Biology. 1 Credit.**

This course provides students an opportunity to organize and orally present research that promote student learning of principles of biomedical sciences. Repeatable to 5 credits.
ANAT 513. Gross Anatomy. 6 Credits.
Gross Anatomy will be an intensive one semester course that will use a regional approach to enhance the understanding of the structural and functional relationships as well as organization of the adult human body. Lectures will be reinforced with complete cadaver dissection and multiple clinical imaging modalities to strengthen problem solving and critical thinking skills. Prerequisites: ANAT 204L and permission of the instructor. S.

ANAT 521. Principles of Developmental Biology. 3 Credits.
This is a student driven course designed to provide the student with a firm understanding of the concepts in developmental biology. Students will be using a wide range of materials from textbooks to the internet to gain a graduate level understanding including how to apply this knowledge to research applications. Student presentations will address advanced principles of developmental mechanisms and underlying human embryology. S.

ANAT 590. Readings in Anatomy and Cell Biology. 1-3 Credits.
Students may elect to do a readings.

ANAT 591. Special Topics in Anatomy and Cell Biology. 1-3 Credits.
A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the anatomical or cell biological sciences. Prerequisite: Permission of instructor. Repeatable to 3 credits.

ANAT 593. Research in Anatomy and Cell Biology. 1-15 Credits.
Research is offered in the specialty fields of the faculty of the department, and involves a variety of problems and research tools in morphology and cell biology. Repeatable.

ANAT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ANAT 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

ANAT 998. Thesis. 1-9 Credits.
Repeatable to 15 credits.

ANAT 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

BIMD Courses

BIMD 492. Peer Teaching and Tutoring in Biomedical Sciences. 1-4 Credits.
A course designed to provide individual students with the opportunity to peer teach and/or tutor for classes in the department of Biomedical Sciences. This experience will occur under the direction of a departmental faculty member. Experiences will have variation dependent on the class the student is assisting with. Open to all students with consent of the faculty member. Repeatable to 12 credits. S/U grading. F.S.SS.

BIMD 494. Directed Studies. 1-4 Credits.
A course designed to provide individual students with the opportunity for creative, scholarly and research activities in Biomedical Sciences under the direction of a departmental faculty member. Repeatable to 12 credits.

BIMD 501. Scientific Discovery I. 6 Credits.
A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will acquire skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. F.

BIMD 502. Scientific Discovery II. 6 Credits.
A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will advance their skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. This course is a continuation and advancement of BIMD 501. Prerequisite: BIMD 501. S.

BIMD 510. Basic Biomedical Statistics. 2 Credits.
A series of lectures, demonstrations and exercises to provide students with the basic rationales for the use of statistics in the assessment of biomedical data and a selected set of the most common and useful statistical tests. Prerequisite: BIMD 500 or permission of course director. S.

BIMD 513. Seminars in Biomedical Science. 1 Credit.
A series of presentations on original research conducted by UND faculty members as well as extramural leaders in academic and industrial research in the biomedical sciences. Students will participate through assigned reading and writing exercises related to the presentations.

BIMD 514. Foundations of Bioinformatics. 3 Credits.
In this course, students will learn fundamental concepts and methods in bioinformatics, a field at the intersection of biology and computing. The course surveys a wide range of topics including bioinformatics web resources, computational sequence analysis, sequence homology searching and motif finding, transcriptome analysis, and network/pathway analysis. Students will also have opportunities to learn about available bioinformatics web-resources (e.g. UCSC Genome Browser, STRING/BioGRID interaction databases, and etc), next-generation sequencing analysis (focusing on RNA-Seq data) as well as relevant data-analysis tools (R and BioConductor, Ingenuity Pathway Analysis, DAVID, etc). The course will also familiarize students with the Linux environment and computational tools needed to manipulate and analyze large biological sequencing data sets. Students will need a familiarity with basic biomedical concepts and basic knowledge of computer usage. No programming skills are required. Students should bring their own wifi-enabled laptop to lectures to fully benefit from the hands-on components of each lecture. Prerequisite: Open to graduate and senior undergraduate students with permission of the instructor. F.

BIMD 516. Responsible Conduct of Research. 2 Credits.
A series of lectures and discussion sessions covering topics related to responsible conduct in research. Students will examine a variety of issues including introduction to ethical decision making, the experience of conflict, laboratory practices, data management, reporting of research, conflict of interest, and compliance. Examples and case studies will be drawn primarily from the biomedical sciences. F.

BIMD 517. Principles of Histology. 3 Credits.
Principles of Histology is a laboratory and discussion based course that builds on prior experience in cell biology and involves a strong self-study component through the use of virtual slides as well as lecture and laboratory orientation videos. By the end of the course the student will have demonstrated a significant knowledge base of tissue microanatomy sufficient for understanding and applying the principles to a wide range of research projects. The student will also have gained sufficient knowledge of histology to be capable of teaching this material to medical, professional, graduate, and undergraduate students. Prerequisite: PATH 500 or permission of instructor. S.

BIMD 518. Grant Writing. 2 Credits.
This is an advanced graduate grant writing and oral presentation course. The objectives of this course are to challenge students: (1) to critically evaluate their own research in an effort to clearly define the significance and innovation of their project, (2) to begin to develop novel ideas based on their research efforts that have the potential to significantly impact their field of study, and (3) to prepare students to present these ideas orally and in writing in a manner that is both logical and convincing. Prerequisites: BIMD 501 and BIMD 502, or consent of instructor. F.

BIMD 520. Principles of Neuroanatomy. 2 Credits.
In this course students will learn the fundamental principles of neuroscience, particularly gross and cellular anatomy, development and systems physiology of the nervous system. Behavioral, cognitive and clinical manifestations of abnormal neural functions will also be addressed. Prerequisite: BIMD 502 or permission of instructor. F.

BIMD 521. Neurophysiology. 2 Credits.
This course is designed to introduce students to the electrical properties of neuronal membranes. The course is organized to first provide a brief review of the basic properties of semi-permeable membranes. The electrical and biochemistry principles that apply to neuronal membranes are discussed. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 522. Principles of Neuropharmacology. 2 Credits.
This course is designed to introduce students to the latest developments in molecular neuropharmacology. The course directive is to provide an up-to-date foundation for clinical neuroscience by emphasizing a comprehensive molecular and cellular approach to the effects of drugs on the nervous system. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 523. Neurochemical Basis of the Nervous System. 2 Credits.
This course is designed to introduce students to fundamental concepts of brain metabolism and neurochemical signaling. It emphasizes recent advances in understanding brain biochemical processes and molecular mechanisms occurring in health and disease. Prerequisite: BIMD 502 or consent of instructor. S.
BIMD 524. Neurodegenerative Diseases and Pathophysiology. 2 Credits.
This course exposes students to diverse neurodegenerative diseases and nervous system pathophysiology. The emphasis is on mechanistic understanding of the most recent advances in the field. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 525. Readings in Neuroscience. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 526. Medical Experiences for Graduate Students. 1 Credit.
The goal of this course is to introduce the graduate student to a "disease-specific" clinical experience so that the student can acquire a better understanding of the importance of translational medicine, develop a firm appreciation of a patient’s and a physician’s understanding of disease and its treatment, and to introduce the student to the overall culture of clinical research. Prerequisites: Successful completion of comprehensive exam and permission of academic advisor and Instructor of Record; student should initiate discussion with the Instructor of Record at least one month prior to the start of enrollment. S/U grading. On demand.

BIMD 530. Components of the Immune System. 2 Credits.
Have you ever wondered why you don't get sick every time you breathe air which can carry as many as 2000 different kinds of microbes on any given day? Or what keeps your defense system from attacking your own cells but can get rid of most invaders without you even noticing? This is the amazing task of your fascinating immune system! This course will provide an overview of cellular and molecular components of mammalian immune system and their function. The students will learn how these components are derived and how they interact and communicate with each other to coordinate a response to pathological insults in order to protect the human body. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 531. Components of Microbial Pathogenesis. 2 Credits.
The objective of the course is to provide students with a background in the mechanisms of microbial pathogenesis. Students will learn basic principles of host-parasite interactions. Paradigms of host-parasite interactions will be illustrated by studying, at the molecular and cellular levels, specific infectious diseases and the agents that cause them. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 532. Microbial Gene Regulation. 1 Credit.
This course will provide an understanding of genetic regulation in bacteria. Classic pathways will be examined as paradigms of regulatory circuits. These examples will be expanded to learn how bacteria exploit host cells as well as the use of bacterial regulatory circuits in modern molecular biology. S.

BIMD 533. Microbial Membranes and Transport. 1 Credit.
This course will explore bacterial membranes with particular emphasis on generation of energy and transport of molecules across the membranes. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 534. Microbial Cell Structure and Function. 1 Credit.
Microbial cells have unique structures that relate their functions. Students completing this course will have an understanding of how prokaryotic and eukaryotic organisms differ and how different structures can be used to obtain similar functions. They will understand how microbial structures influence interactions between microbes and between microbes and eukaryotic organisms. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 535. Bacterial Host: Pathogen Interactions. 1 Credit.
The objective of the course is to provide students with a background in the fundamental aspects that occur at the bacterial: host interface. Students will learn the interplay between bacterial virulence factors, strategies used to evade host defenses, and host responses to infection. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 536. Molecular Biology and Pathogenesis of Viruses. 1 Credit.
This course will cover the structure, replication, and pathogenesis of human RNA and DNA viruses, the host immune response to viral infection and the strategies employed by viruses to escape immune detection and elimination. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 537. Host-Pathogen Interactions involving Eukaryotic Microbes (Parasites/Fungi). 1 Credit.
Eukaryotic microbe infections have a devastating impact on global health and economic development as they infect over one third of the world's population and cause acute and chronic pathologies. Furthermore, macroscopic parasites (helminths/ worms) are master regulators of host inflammatory response and hence reduce the immune response to coinfections and negatively affect the success of vaccination programs against many other pathogens. In contrast, it has been proposed that the rise in autoimmune diseases in the developed world could be a direct result of the successful complete elimination of parasitic helminths in these communities. Thus, the purpose of this course is to provide a basic knowledge of the clinically important eukaryotic microbe pathogens and the immune response associated with their infections. A series of lectures will cover course components; a) basic introduction to protozoa, helminth, and fungi, and b) basic knowledge of the immune response and its involvement in parasitic/ fungal infections. An effort has been made to increase clinical relevance and problem-solving skills through a team-learning exercise involving quiz and paper presentations. S.

BIMD 538. Immunological Disorders. 1 Credit.
This course will include discussion of cellular and molecular immunopathologies leading to autoimmune diseases, and primary and secondary immunodeficiencies; and the role of the immune system in tumors, organ transplantation, and general methods of modification of the immune response. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 539. Readings in Microbiology and Immunology. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 590. Research. 1-12 Credits.
The course allows research in pertinent problems in various aspects of biomedical sciences. Repeatable. F.S,SS.

BIMD 591. Advanced Topics in Biomedical Sciences. 1-3 Credits.
A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the biomedical sciences. Repeatable as topics vary. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 6 credits. On demand.

BIMD 988. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F,S,SS.

BIMD 998. Dissertation. 1-12 Credits.
Completion of dissertation required for Ph.D. Repeatable to 12 credits. F,S,SS.

BMB Courses

BMB 514. Current Literature. 1 Credit.
Students of the department rotate in leading informal reviews, analyses, and the discussions of research papers selected from current journals in the areas of biochemistry and molecular biology. Prerequisite: BIMD 500 or consent of instructor. S/U grading.

BMB 521. Seminar. 1 Credit.
Students present topics in biochemistry and molecular biology based on reviews of the current literature. Each presentation is followed by a discussion of the topic by the faculty and students of the department. Prerequisite: BIMD 500 or consent of instructor. S/U grading.

BMB 533. Advanced Topics. 1 Credit.
The purpose of this course is to provide an in-depth exploration of selected areas of protein structure and function, metabolism, regulation of cell functions, proteomics, recombinant DNA technology, eukaryotic nucleic acid metabolism, and gene expression with the intent of complementing and extending the knowledge base gained in BIMD 500. Extensive independent learning is expected. Prerequisites: BIMD 500; alternatively, BMB 301 or equivalent and permission of instructor. Repeatable to 9 credits.

BMB 540. Special Topics. 1-3 Credits.
Discussion of a topic in biochemistry and/or molecular biology of current interest to faculty and students. Prerequisites: BIMD 500 or consent of instructor. Repeatable to 3 credits.

BMB 590. Research. 1-12 Credits.
The assignments deal with pertinent research problems in various aspects of biochemistry and molecular biology. Repeatable.
MBIO 507. Seminar in Microbiology. 1 Credit.
S/U grading. F.
MBIO 511. Microbiology and Immunology Literature. 1 Credit.
A series of reports of current scientific literature in Microbiology and Immunology. S/U grading. S.
MBIO 513. Research Tools. 2 Credits.
Orientation to research and laboratory safety. The theory and application of modern laboratory techniques include tissue culture, cell fractionation, enzyme assay, immunization procedures, bacterial growth curves, photomicrography, strain construction, genetic engineering, gel electrophoresis, enzyme immunoassay, and western blot techniques are presented. S/U grading. F.
MBIO 515. Advanced Topics. 2 Credits.
A series of topics in microbiology and immunology presented on an episodic basis. The topics may vary, but are expected to include: (A) Immunology, (B) Infectious Diseases, and (C) Molecular Biology. Prerequisite: Previous basic course in the area to be covered.
MBIO 590. Research in Microbiology. 2-6 Credits.
Advanced problems in microbiology and related fields. Hours arranged. Repeatable.
MBIO 591. Special Problems in Microbiology. 1-6 Credits.
Short-term research projects. Repeatable.
MBIO 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.
MBIO 997. Independent Study. 2 Credits.
Repeatable to 8 credits.
MBIO 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

PPT Courses
PPT 500. Principles of Physiology and Pharmacology. 6 Credits.
Graduate level survey course covering basic principles of human physiology and pharmacology. Material covered will include the physiology (how the body works) and the pharmacology (how drugs affect physiological functions) of the major organ systems. Covered also will be basic pharmacological principles including pharmacodynamics, pharmacokinetics and therapeutics. Teaching modalities used are designed to actively engage students in critical thinking and knowledge application. Prerequisite: BIMD 500 or consent of instructor.

PPT 503. Advanced Pharmacology or Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 505. Research Techniques. 1-3 Credits.
Prerequisite: Consent of instructor.

PPT 511. Biochemical and Molecular Mechanisms of Pharmacology. 3 Credits.
Fundamental concepts of pharmacology with emphasis on biochemical and molecular mechanisms. Prerequisites: BIMD 500 and PPT 500, or consent of instructor.

PPT 512. Special Topics in Pharmacology, Physiology and Therapeutics. 2 Credits.
An in-depth coverage of a particular topic chosen by the instructor. Prerequisite: Consent of instructor.

PPT 521. Seminar in Pharmacology, Physiology and Therapeutics. 1 Credit.
S/U grading.

PPT 525. Advanced Renal Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 526. Advanced Respiratory Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 528. Advanced Endocrinology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 529. Adv Cardiovascular Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 530. Advanced Neurochemistry. 3 Credits.
This course is designed to introduce graduate students to the discipline of neurochemistry. This course builds on concepts introduced in PPT 500, with an emphasis on brain biochemical processes occurring in health and disease. Prerequisite: PPT 500 or consent of instructor.

PPT 590. Readings in PPT. 1-4 Credits.
Prerequisite: Consent of instructor. Repeatable to 8 credits.

PPT 591. Research in PPT. 1-15 Credits.
Repeatable.

PPT 996. Continuing Enrollment. 1-12 Credits.
Prerequisite: Consent of instructor. Repeatable. S/U grading.

PPT 998. Thesis. 1-9 Credits.
Prerequisite: Consent of instructor. Repeatable to 9 credits.

PPT 999. Dissertation. 1-12 Credits.
Prerequisite: Consent of instructor. Repeatable.

Business Administration
http://business.und.edu/mba/

FACULTY: Askim-Lovseth, Bateman, Beneda, Biederman, Braathen, Byars, Campbell, Chuang, de Magalhaes, Dosch, Ellingson, Flynn, Goenner, Hollingworth, Jensen, Lawson-Body, Lee, Nam, Notbohm, O’Neill, Schultz (Program Director), Simlai, Smith, Tan, Valentine, Wang, Yang, and Zuo

Degree Granted: Master of Business Administration (MBA)
The Master of Business Administration (MBA) is a professional degree with a program designed to prepare persons for general management responsibilities at the executive level. The program is accredited by the Association to Advance Collegiate Schools of Business International (AACSB). The recipient of the degree must have demonstrated critical, analytical, and decision-making abilities in the broad area of management and also must have demonstrated an ability to study and write in one specialized area. The MBA degree program is designed for individuals who have an undergraduate background in a field other than business, as well as for those with undergraduate training in business.

The MBA program is available as part of a combined program resulting in both an undergraduate degree in a business area plus an MBA degree in five years.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Mission Statement and Program Goals
Through student/instructor interaction, the MBA program encourages development of critical, analytical, and decision-making abilities in a global business environment. The program provides a broad-based, graduate-level business education with opportunities for specialization. The program presents contemporary business concepts and theory, while also demonstrating their application in practical interdisciplinary business settings.
Goal 1: Students will be able to integrate different functional areas of organizations when analyzing various business situations.

Goal 2: Students will develop written, oral, and interpersonal communication skills.

Goal 3: Students will be able to analyze economic and financial information that will enable them to reach sensible business decisions.

Master of Business Administration (M.B.A.)

Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university.
2. An overall grade point average of at least 3.00 in the undergraduate degree program or of at least 3.25 for the last two years, or equivalent, of undergraduate work (based on 4.00 scale).
3. Completion of the Graduate Management Admission Test (GMAT) with a score that equals or exceeds an overall total score of 500. In certain circumstances, applicants may substitute the GRE (with similar percentile scores expected to those noted above). This situation will be determined on a case-by-case basis.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Minimum competence in business math and statistics, accounting, economics, and finance. This competence is normally demonstrated by having a bachelor’s degree in business administration, previous equivalent course work in each of four subject areas, or by successful completion of self-paced boot camp courses on these topics from Ivy Software (http://ivysoftware.com).

M.B.A. Prerequisite Competence

Applicants must demonstrate a minimum competence in business math and statistics, accounting, economics, and finance. Competence in these foundational topics can be demonstrated in three ways:

1. Possessing a bachelor’s degree in business administration, with the grade point requirements stated above.
2. Completion of equivalent course work in the four topics areas, with a grade of “B” (or the equivalent) or better in each course. The MBA Program Director will determine if previous course work meets the expectations for entering students.
3. Successful completion of self-paced online boot camp courses on these topic areas from Ivy Software (http://ivysoftware.com). Students can go directly to Ivy Software’s web site for registration information. Students must achieve a score of 80% or greater in each course in order to successfully complete the prerequisite requirement. Students will have a maximum of 2 attempts to successfully complete each course; students that fail to pass the boot camp course after 2 attempts will be required to complete an undergraduate course judged by the MBA Program Director to be equivalent to that subject, with a grade of “B” (or the equivalent) or better.

Ivy Software Boot Camp Course List


Degree Requirements

Students seeking a Master’s degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Master of Business Administration Program.

The M.B.A. degree program is an interdisciplinary program taught by the faculty in several departments within the College of Business and Public Administration. The M.B.A. Program Director is responsible for coordinating all aspects of the program. Business courses carrying graduate credit status from the Department of Accounting, Economics and Finance, Marketing, Management, and Political Science and Public Administration, and the School of Entrepreneurship are described elsewhere in the graduate catalog. The M.B.A. degree program requirements are:

1. A minimum of 43 semester credits of academic work. The program includes 34 credit hours of required core course credits and an additional 9 credit hours in a required concentration.
2. The 34 required core course credits are organized into 4 modules: Executive Management, Business Analytics, Financial and Economic Analysis, and Strategy.
3. At least one-half of the credits must be at or above the 500-level. A maximum of one-fourth (usually 9 semester credits) of the credit hours required may be transferred from another institution.
4. The requirement of the final examinations for the M.B.A. degree is satisfied by the successful completion of MGMT 585 Advanced Strategic Management. MGMT 585 Advanced Strategic Management has four prerequisites which MUST be completed prior to enrollment:
   a. ACCT 509 Accounting Information for Decision and Control
   b. FIN 501 Managerial Finance
   c. MGMT 515 Advanced Managerial Theory
   d. MRKT 510 Strategic Market Planning
5. Students are required to make a final presentation to a panel of assurance of learning reviewers during their last semester of study, and maintain an assurance of learning portfolio throughout their program of study.

The M.B.A. curriculum includes the following required courses:

Executive Management Module

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 505</td>
<td>Organization Leadership and Ethics</td>
<td>2</td>
</tr>
<tr>
<td>MGMT 515</td>
<td>Advanced Managerial Theory</td>
<td>3</td>
</tr>
<tr>
<td>BADM 500</td>
<td>The Successful MBA--Executive Skills</td>
<td>2</td>
</tr>
</tbody>
</table>

Business Analytics Module

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISBC 510</td>
<td>Business Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 506</td>
<td>Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 501</td>
<td>Quantitative Analysis for Management Decisions</td>
<td>3</td>
</tr>
</tbody>
</table>

Financial and Economic Analysis Module

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 502</td>
<td>Financial Reporting and Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 509</td>
<td>Accounting Information for Decision and Control</td>
<td>3</td>
</tr>
<tr>
<td>FIN 501</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
</tbody>
</table>

Strategy Module

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRKT 510</td>
<td>Strategic Market Planning</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 545</td>
<td>Strategic Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 585</td>
<td>Advanced Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration

Total Credits 43

M.B.A. students can choose among the following concentrations:

General Concentration

Students can choose 9 credit hours for the General Concentration chosen from courses offered at the 300-, 400- and 500-level in the areas of Accounting, Economics, Entrepreneurship, Finance, Information Systems and Business Communications, Marketing, Management, Political Science & Public Administration and other fields, e.g., Aviation Management. M.B.A. students taking courses at the 300- and 400-level for graduate credit are expected to perform at a higher level, both in the quality and quantity of work. All General Concentration courses must be approved by the M.B.A. Program Director prior to enrollment.

Social Entrepreneurship Concentration

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 561</td>
<td>Creation and Management of Social Enterprises</td>
<td>3</td>
</tr>
<tr>
<td>POLS 562</td>
<td>Political Advocacy and Social Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 580</td>
<td>Seminar in Social Entrepreneurship</td>
<td>3</td>
</tr>
</tbody>
</table>

International Concentration
The International Business concentration requires students to study abroad at a foreign college/university that has a formal course transfer agreement in place with UND. Students will complete the first and last semesters of their program of study at UND. Courses to be taken at the foreign college/university, and included in the program of study, must be approved by the M.B.A. Director prior to registration. Students are expected to take a workshop or course of study in cultural language studies from the foreign college/university.

Students who already have completed courses similar to those in the M.B.A. curriculum may be required to choose substitutes from the graduate credit offerings listed in this catalog. Substitutions require the prior approval of the M.B.A. Program Director and the Graduate Dean.

Final Examinations. The requirement of the final examinations for the M.B.A. degree is satisfied by the successful completion of MGMT 585 Advanced Strategic Management.

Master of Business Administration (M.B.A.)/Juris Doctor (J.D.) Combined Program

Admission Requirements

1. Students are required to apply to both the Law School and the School of Graduate Studies. Admission recommendations will be made to the School of Graduate Studies by the Director of the M.B.A. Program and approved by the Graduate Dean. The Law School Admissions Committee will determine admission into the Law School.

2. Students are expected to fulfill the minimum competence requirements prior to beginning M.B.A. course work.

3. Students pursuing a J.D. degree and wishing to add the M.B.A. degree must do so no later than the third semester of the J.D. program.

4. Admission requirements of each program will remain the same in the joint admission process as what is currently required to be admitted into each program separately.

Degree Requirements

If each degree were earned separately, a student would be required to complete 90 credit hours for the J.D. degree and 43 hours for the M.B.A. The joint degree program will enable a student to receive the two degrees upon completion of 81 law credit hours and 34 M.B.A. credit hours. The School of Law thus accepts 9 credit hours of M.B.A. coursework that will be applicable toward the J.D. degree, and the College of Business and Public Administration accepts 9 credit hours of J.D. courses toward the M.B.A. degree. The total credits required for each degree will be unchanged, because each program will accept credits toward the other degree.

In addition to the required courses for all students earning the J.D. degree, students enrolled in the joint degree program must successfully complete the following School of Law courses: Business Associations, and at least two Commercial Law courses. Other School of Law courses may be chosen to fulfill elective requirements.

Sample Curricular Plan (degree completion in four years)

The first year of the joint degree program will consist of the required curriculum in the School of Law. The third semester of the joint degree program will usually consist of law school courses, with M.B.A. Curriculum courses beginning in the fourth semester. To promote the integration of the two courses of study, courses after the third semester usually will be taken in each of the schools concurrently, rather than having the student located exclusively in one school or the other for an entire semester. Note: This timetable assumes that all undergraduate prerequisite courses have been completed prior to entering the joint program.

Semester 1 (Fall only)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required first year curriculum in the School of Law</td>
<td>16</td>
</tr>
</tbody>
</table>

Semester 2 (Spring only)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required first year curriculum in the School of Law</td>
<td>16</td>
</tr>
</tbody>
</table>

Semester 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses in the School of Law</td>
<td>15</td>
</tr>
</tbody>
</table>

Semester 4

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 M.B.A. courses</td>
<td>7</td>
</tr>
<tr>
<td>Courses in the School of Law</td>
<td>6</td>
</tr>
</tbody>
</table>

Semester 5

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 M.B.A. courses</td>
<td>9</td>
</tr>
<tr>
<td>Courses in the School of Law</td>
<td>6</td>
</tr>
</tbody>
</table>

Semester 6

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Courses in the School of Law</td>
<td>6</td>
</tr>
<tr>
<td>2 M.B.A. courses</td>
<td>6</td>
</tr>
</tbody>
</table>

Semester 7

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses in the School of Law</td>
<td>7</td>
</tr>
<tr>
<td>2 M.B.A. courses</td>
<td>6</td>
</tr>
</tbody>
</table>

Semester 8

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses in the School of Law</td>
<td>9</td>
</tr>
<tr>
<td>2 M.B.A. courses</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Credits

| Total                                                | 115     |

Normally, the joint program will be completed in only four years. With summer school classes it may be possible to obtain both degrees even more quickly. All degree requirements in the Law School must be completed within 84 months of starting the program. Both degrees will be awarded simultaneously after all degree requirements are met in both programs.

ACCT Courses

ACCT 501. Seminar in Financial Accounting. 3 Credits. Addresses current issues in financial accounting and develops appropriate professional judgment by understanding theory, concepts, and issues underlying the financial accounting and reporting process.

ACCT 502. Financial Reporting and Decision Making. 3 Credits. This course provides an overview of financial accounting terminology and concepts, financial statements, and the financial reporting process. Emphasis is placed on the decision usefulness of financial statement information and the financial reporting process as a means of communicating information about firms. Prerequisite: Successful completion of Iovy Software's "Business Math and Statistics-Graduate" self-paced course or demonstrated equivalent competencies. F.S.

ACCT 504. Seminar in Auditing. 3 Credits. Expands understanding of the auditing function and provides a framework for analyzing contemporary auditing and assurance issues. Prerequisite: Satisfactory evidence of academic training or practical experience.

ACCT 507. Advanced Managerial Accounting. 3 Credits. Functional uses of accounting in management of the enterprise.

ACCT 508. Fraud Examination. 3 Credits. Focuses on understanding types of fraud as well as collecting and evaluating evidence relating to preventing and detecting frauds. Evidence gathering methods will include the examination of documents, publicly available information, and standard practices for interviews and interrogations. Prerequisite: ACCT 405 or equivalent.

ACCT 509. Accounting Information for Decision and Control. 3 Credits. Management accounting concepts and their application in internal planning, control, and decision-making. Prerequisite: ACCT 502. F,S.

ACCT 575. Special Topics. 3 Credits. Specific topic will vary from offering to offering at the discretion of the department. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of nine credits with permission of department. Prerequisite: Permission of department. Repeatable to 9 credits.

ACCT 590. Contemporary Readings in Accounting. 2 Credits. Review of outstanding monographs and other writings in the field of accounting.

ACCT 591. Accounting Research. 1-6 Credits. Individual student projects designed to develop skills in accounting research.

ACCT 592. Research in Federal Tax. 1-4 Credits. Research in Federal Income Tax with emphasis on corporations and shareholders. Prerequisite: ACCT 411 or equivalent. Repeatable to 4 credits.
ACCT 593. Research in Business Law. 1-4 Credits.
Individual projects designed to develop basic skills in legal research.
ACCT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.
ACCT 997. Independent Study. 2 Credits.
The independent study requires the student to investigate a topic in accounting and to prepare a formal report satisfactory to the MAcc Program Director.
ACCT 998. Thesis. 1-15 Credits.

Undergraduate Courses for Graduate Credit
ACCT 309. Accounting Information Systems. 3 Credits.
The application of systems design and use from the accountant’s perspective. Coverage includes computerized and manual accounting systems, elements of internal control, flowcharting, and the interface of accounting and management information systems. Prerequisites: ACCT 301 and Junior or Senior Standing; declared CoBPA majors only. F.S.
ACCT 312. Fund Accounting. 3 Credits.
Financial accounting, control, and reporting for governmental and not-for-profit entities. Prerequisites: ACCT 201 and ACCT 218; Junior or Senior Standing; declared CoBPA majors only. F.S.
ACCT 401. Advanced Accounting. 3 Credits.
Special problems in accounting including consolidated statements, partnerships, and foreign exchange. Prerequisites: ACCT 302; Junior or Senior Standing; declared CoBPA majors only. F.S.
ACCT 403. Contemporary Accounting Theory. 3 Credits.
A study of the emerging issues and the problems facing the accounting profession with special emphasis on the authoritative pronouncements as designated by the American Institute of CPAs and the Financial Accounting Standards Board. S-U grading not allowed. Prerequisite or Corequisite: ACCT 401 or consent of instructor; declared CoBPA majors only. F.S.
ACCT 405. Assurance Services. 3 Credits.
Explores methods of improving the quality of information or its context for decision makers. Examples include assurances on the reliability of financial statements, the processes and controls used to manage and operate businesses, assertions and agreements made to third parties, and regulatory compliance. Prerequisites: ACCT 302, ACCT 309, ECON 210; Junior or Senior Standing; declared CoBPA majors only. F.S.
ACCT 406. Independent Assurance. 3 Credits.
Auditing and assurance theory as applied by independent accountants. Prerequisites: ACCT 405 or consent of instructor; declared CoBPA majors only. S.
ACCT 410. Federal Individual Income Tax. 3 Credits.
Federal income tax relating to individuals to include the more complex tax situations. A computerized individual income tax preparation is used as a part of the course. Prerequisites: ACCT 201; Junior or Senior Standing; declared CoBPA majors only. F.S.
ACCT 411. Business Income Taxation. 3 Credits.
Federal income tax relating to corporations and partnerships. Introduction to estate and gift tax and fiduciary income tax. Prerequisites: ACCT 302; Senior Standing; declared CoBPA majors only. F.S.
ACCT 416. Advanced Business Law. 3 Credits.
Advanced topics and contemporary issues in business law including ethics, legal representation in business, and the impact of selected governmental regulations on businesses. Prerequisites: ACCT 315 and Senior Standing; declared CoBPA majors only. F.S.

BADM Courses
BADM 500. The Successful MBA--Executive Skills. 2 Credits.
Effective leadership requires a diverse set of skills; it requires vision, strategy, planning and inspiration, yet all of these skills are hinged on communication. Executives must communicate across various channels, use multiple modes, and communicate with individuals and teams. This course presents communication as integral to management strategy and as a critical component for success in the workplace. In this course we examine the fundamental skills necessary to succeed as an executive, examine fundamental communication strategies, and then put them into practice. Further, because effective group communication is a necessity in today’s workplace we will learn and practice skills in designing presentations. The schedule will reflect eight learning modules that discuss professionalism, managing impressions, crafting arguments, managing conflict, leveraging diversity, working in teams, presenting in groups, and reflecting on skills, motivators and influences. F.S.SS.
BADM 502. Business Research Methods. 3 Credits.
A study of the methodology of research involving research design, problem definition, information sources, data collection instruments, and the organization and writing of a research paper. Prerequisite: Completion of MBA foundation courses or consent of instructor.
BADM 597. Graduate Cooperative Education. 1-3 Credits.
A practical experience with an employer closely associated with the student's academic area. A written report describing the student’s job related experiences will be prepared. Prerequisite: Approval of MBA director. Repeatable to 3 credits. S/U grading.
BADM 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.
BADM 997. Independent Study. 2 Credits.
BADM 998. Thesis. 4 Credits.

ECON Courses
ECON 503. Government and Business. 3 Credits.
ECON 504. Advanced Price Theory. 3 Credits.
Economic theory and methodology: theory of consumer behavior and demand; theory of production and distribution; equilibrium in commodity and factor markets; general equilibrium and welfare; behavior of economic agents in imperfect competition. Particular attention is given to efficiency and equity ramifications of perfectly competitive economic systems. Prerequisite: ECON 308. Prerequisite or Corequisite: ECON 416.
ECON 505. Advanced Macroeconomic Theory. 3 Credits.
Advanced study of macroeconomic theoretical models with particular attention to the analysis of business cycles, income growth and evaluation of public policies concerned with inflation and unemployment. Prerequisites: ECON 309 and ECON 416.
ECON 506. Econometrics. 3 Credits.
Econometric methods, theory, and applications. Topics include linear regression, least-squares estimation, inference, and hypothesis testing. Prerequisite: Admission to the MBA or MSAE program, or department consent required. S.
ECON 509. Macroeconomic Decision Making. 3 Credits.
Examination and utilization of theory and empirical evidence on macroeconomics in the business decision-making process will be stressed. Particular emphasis will be placed on inflation, interest rate changes, business taxation, and exchange rate movements. Prerequisites: ECON 202 and MATH 146.
ECON 510. Topics in Applied Econometrics. 3 Credits.
Statistical models and applied econometrics methods relevant to estimation and the testing of economic relationships. Prerequisite: ECON 506. S.
ECON 514. Advanced Managerial Economics. 3 Credits.
Microeconomic analysis applied to business decision-making. Topics include: the nature and scope of the firm, strategic decisions concerning product line, pricing, entry or exit from specific markets and the internal organization of the firm. Case studies are utilized as a main method of analysis. Prerequisites: ECON 201, ISBC 217 and MATH 146, or consent of instructor.
ECON 524. Advanced International Economics. 3 Credits.
This course provides a broad overview of international trade theory, policy, and/or international finance. The course focuses on empirical application based on these theories. Prerequisite: ECON 506. F.

ECON 534. Applied Economic Analysis. 3 Credits.
This is an applied course in economics, the purpose of which is to build on the tools learned in previous coursework, learn new tools, and discover how to apply these tools to the analysis of data from the real world. The course includes theory, though the focus is on applying the tools of modern econometrics to the study of cross sectional, time series, and panel data. Prerequisites: ECON 411, ECON 416 and ECON 506. F.

ECON 545. Applied Public Economics. 3 Credits.
This course aims to familiarize the student with the current literature on the economics and econometrics of policy and program evaluation. Prerequisites: ECON 506 and ECON 504. S.

ECON 565. Demographic Methods for Economics. 3 Credits.
We examine the three key demographic processes: mortality, fertility, and migration. The course emphasis will be on model development for each of the processes. Applications include economic policy issues such as pensions, medical insurance, and other current issues. Prerequisite: ECON 210. SS.

ECON 575. Advanced Special Topics. 1-3 Credits.
Topics of course will change from semester to semester but will typically emphasize an important aspect of economic theory or a significant issue in economic policy. Repeatable to 6 credits with different topics. Repeatable to 6 credits.

ECON 580. Economic Development: Global, National, and Regional Issues. 3 Credits.
The first part of this course focuses on growth theories, globalization and economic development and sustainable growth among less developed, developing, and more developed countries, as well as countries in transition to market economies. The second part of the course specifically examines economic development for advanced nations, incorporating rural, urban and regional economic analysis. Issues such as rural technology, employment, poverty, housing, transportation, location problems, industrialization, urbanization and sustainable growth in North Dakota and North Central Region are explored. Prerequisite: Department consent. F.

ECON 592. Research in Economics. 2-3 Credits.
Research work and use of original documents; collecting of material and preparing of special topics and bibliographies; familiarizing the student with government publications and other material available for study of economic problems.

ECON 596. Applied Economics Research Seminar. 3 Credits.
Seminar course intended to strengthen and further develop essential skills of research and formal presentation (written and oral) for both academic and professional audiences. Students will apply these skills to the development of their individual Independent Study or Thesis Project Proposal. Enrollment is restricted to MSAE degree students who plan to complete their Independent Study or Thesis in the following academic year. SS.

ECON 597. Economic Research Internship. 1-3 Credits.
An internship is designed to provide the student with an opportunity for participating in a supervised work experience directly related to the field of training. Students will work closely with the program adviser in planning the internship with an approved cooperating institution. Prerequisite: Permission of program director. Repeatable to 3 credits. F, S, SS.

ECON 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ECON 997. Independent Study. 3 Credits.
The independent study is a capstone for MSAE students on the non-thesis track. The course requires the student to investigate a topic or research question in applied economics that is assigned by the instructor. The student will prepare a research paper demonstrating his/her ability to creatively apply the various methods and perspectives taught in the MSAE program in addressing the assigned problem. Students will also be required to develop a presentation for their paper. F, S.

ECON 998. Thesis. 4 Credits.
The thesis is an original research project completed under the supervision of a thesis committee.

Undergraduate Courses for Graduate Credit

ECON 324. Public Finance. 3 Credits.
Growth and effects of the public sector of the economy emphasizing effects of taxation and spending or borrowing and debt management on efficiency and use of economic resources. Prerequisites: ECON 201 and ECON 202.

ECON 338. International Economics. 3 Credits.
Economic basis for gain in international trade; capital and population movements; international disequilibrium and the process of balance-of-payments adjustments; tariffs, underdeveloped countries. Prerequisites: ECON 201 and ECON 202. F, S.

ECON 341. Labor Economics and Labor Relations. 3 Credits.
A survey of the nature and causes of the economic problems of the American wage and salary earner and of the attempts of wage earners and society, through organizations and legislation, to alleviate these problems. The course comparatively surveys the history and systematic theories of labor movements and the market and institutional influences on wages and employment. Particular emphasis will be placed on the law of industrial relations, employment and income access, and the adjustment of labor disputes. Prerequisites: ECON 201 and ECON 202. F.

ECON 355. Government Regulation of Business. 3 Credits.
An exploration of the many ways that federal and state governments regulate business activity. Government regulation falls into three broad areas: economic regulation; social regulation; antitrust laws. The historical development of regulation, from both a legal and economic perspective, will be discussed. Particular attention will be paid to the current trend toward deregulation of previously regulated industries such as airlines, telecommunications, and trucking. Prerequisites: ECON 201 and ECON 202. F.

ECON 400. History of Economic Thought. 3 Credits.
Broad overview of the major schools of thought, including Mercantilist, Physiocrat, Classical, Marxian, Socialist, Historical, Austrian, Neoclassical, Institutional, Keynesian, and Monetarist. The coverage includes value theory, income/expenditure theory, growth/development theory, scientific method, scope and public policy. Prerequisites: ECON 105 or ECON 201, and ECON 202. S.

ECON 410. Empirical Methods in Economics I. 3 Credits.
This course is an introduction to econometrics, the joint area of economics and statistics dealing with the application of statistics to economic problems. The course objectives are to acquire a basic understanding of the theory and methods of econometrics and to gain practical experience in utilizing these methods. The students will use the tools developed in the course in homework and written assignments so that they can develop an insight to theory and its application. Prerequisites: ECON 201, ECON 202 and ECON 210. F.

ECON 411. Economic Forecasting. 3 Credits.
An introduction to Economics Forecasting and Time Series Analysis. The course will cover specifications and estimation of ARMA models, seasonality, non-stationarity, unit roots and forecast evaluations. Empirical applications are used throughout the course. Prerequisite: ECON 410 or ECON 506. S.

ECON 416. Mathematics for Economists. 3 Credits.
Study of mathematical methods in the areas of introductory calculus and linear algebra, and their application to economic analysis. Mathematical analysis of static and dynamic equilibrium models, growth models, distribution, production functions, cycles, activity analysis, mathematical programming, and model building. Prerequisites: ECON 308 and ECON 309; MATH 146 or MATH 165. On demand.

ECON 438. International Money and Finance. 3 Credits.
Identification of key international financial concepts and analysis of their relationships in the international money and capital markets; determination of the balance of payments and exchange rates; and examination of alternative organizations of the international monetary system. Prerequisite: ECON 303. F.

ENTR Courses

ENTR 575. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Course may be repeated once with topic change. Prerequisite: Departmental permission. Repeatable to 6 credits.
ENTR 580. Seminar in Social Entrepreneurship. 3 Credits.
Social Entrepreneurship is a rapidly growing, interdisciplinary area of interest that draws on entrepreneurial knowledge and skills to craft innovative businesses that address social needs. This course explores current trends in both the private and social sectors, which are creating space for innovation and opportunities for individuals to apply their business skills to drive positive and large scale social change. We will explore major opportunities and challenges presented by social enterprise through examining a variety of models ranging from social purpose to the creation of social ventures. Students will work in teams to conduct a feasibility study for a social entrepreneurship related project. Through the project, students will enhance and apply their understanding of business strategies and processes that enhance sustainability and social impact. These strategies can include launching revenue-generating enterprises, developing a marketing plan for an existing social enterprise, or creating strategic partnerships with the private sector. Students will also gain practical skills necessary to develop and manage a high-impact social venture. F, odd years.

FIN Courses

FIN 501. Managerial Finance. 3 Credits.
The development of financial decision-making skills, using the case-analysis method, through application of financial theory to topical areas of analysis, planning, control, asset management, financial instruments, markets, capital structure, dividend policy, cost of capital, etc. Prerequisite: Successful completion of IVY Software’s “Understanding Corporate Finance” self-paced course or demonstrated equivalent competencies. F.S.

FIN 520. Investment Theory and Management. 3 Credits.
An introductory course designed for MBA students in the study of the usage and valuation of the major investment vehicles popular today. Although the ultimate objective is to develop a conceptual framework in which the student can expand his or her knowledge of the investment field, the course is taught in a practical fashion and incorporates materials from both the Chartered Financial Analyst (CFA) and Certified Financial Planner (CFP) curricula. Prerequisite: FIN 501 or consent of instructor.

FIN 575. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of nine credits with permission of department. Prerequisite: Departmental permission. Repeatable to 9 credits.

Undergraduate Courses for Graduate Credit

FIN 420. Investment Analysis and Portfolio Management. 3 Credits.
Comprehensive study of methods used to evaluate securities. Includes formulation of investment strategy and analysis, design of portfolios for classes of individual investors and institutions, fundamental analysis and portfolio performance evaluation. Extensive use of financial databases and software. Prerequisites: FIN 340 and FIN 360; Junior or Senior Standing; declared CoBPA majors only. F.

FIN 475. Cases in Managerial Finance. 3 Credits.
Introduces students to construction and utilization of financial management decision models using case study examples. Topics evaluated include working capital management, capital budgeting, cost of capital, capital structure, dividend policy, valuation, risk-return, and special topics of financial management. Students are required to develop original simulation models, prepare formal case reports, and orally and visually present their results. Prerequisites: FIN 340 and FIN 360; Junior or Senior Standing; declared CoBPA majors only. S.

ISBC Courses

ISBC 510. Business Intelligence. 3 Credits.
A business intelligence (BI) system is an information system that supports decision making process. BI is also about creating strategic value for organizations based on data. This course provides critical thinking and self-learning abilities by discovering the business intelligence and data analytic challenges. The expected outcome of the course will allow each student to have a solid understanding of current and emerging issues and best practices of data visualization and data analytics. Students will also gain a strong business process analysis experience. The course will challenge each student in her/his ability to use big data, predictive data analysis, data gathering techniques, data warehouse, knowledge management, data mart, and data mining systems. These challenges are becoming a prevalent factor in the present turbulent business environment. Prerequisite: Admission to the MBA program or department consent required. F.S.

ISBC 517. Advanced Accounting Systems. 3 Credits.
An advanced study of integrated information systems and how these affect business decisions. Prerequisite: ACCT 309 or permission of instructor.

ISBC 520. Communication for the Professional. 3 Credits.
Examines theory and research relevant to understanding the communication process. Topics include strategies of organizing, globalization, technology, power, and dignity.

ISBC 590. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of 6 credits with permission of department. Prerequisite: Departmental permission. Repeatable to 6 credits.

MGMT Courses

MGMT 501. Quantitative Analysis for Management Decisions. 3 Credits.
The topic of quantitative business modeling is relevant to all business professionals. Management in today's turbulent economic times requires a full breadth of management skills and capabilities. This course provides comprehensive coverage of both traditional management skills and new competencies needed in a turbulent economic environment characterized by economic turmoil and general uncertainty of the future. This course is designed for any manager who is engaged in solving difficult business problems. The key to problem solving is knowing how to select and then use the right tools. The primary goals of this course are to provide a variety of quantitative models that should be useful in solving business problems, explain how they work, and show how the decision maker can apply and interpret them. This course covers various topics, such as linear programming, sensitivity analysis, network models, integer programming, nonlinear programming, and forecasting. Spreadsheet-based tools and techniques will be extensively utilized in building various decision models for effective decision making in this course. Because Excel currently offers the best collection of built-in analytical capabilities, it will be used with this course. Prior experience with Excel is certainly helpful, but it is not required. Prerequisites: Admission to the MBA program and ECON 506. S.SS.

MGMT 505. Organization Leadership and Ethics. 2 Credits.
This course will explore concepts of leadership and ethics in organizations and business. Students will examine major theories of leadership and their application to groups and organizations, models of ethical thinking and behavior, and how managers can effectively lead others in a responsible manner. Prerequisite: Graduate standing.

MGMT 515. Advanced Managerial Theory. 3 Credits.
This course will explore the management of people and organizations. Students will examine concepts of the behavior of individuals and groups within organizations, motivation, decision making, conflict, organization design, and human resource management, and explore the application of theories in management practice. Prerequisite: Graduate standing. F.S.
MGMT 545. Strategic Supply Chain Management. 3 Credits.
Contemporary supply chains are complex systems that must be constantly adapted with the changing environment in which they are functioning. This course will explore the management of supply chains including concepts of supply chain networks, supply chain strategies, and some analytic tools for supply chain performance. It is the vital responsibility of supply chain managers to continuously improve their firm's competitive position in the marketplace. Students will examine how supply chains can be organized effectively (strategic) and efficiently (operational) in order to satisfy the market, customer demand, and supply chain trading partners. Prerequisites: Admission to the MBA program and completion of "Business Math and Statistics" course from Ivy Software.

MGMT 575. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of 9 credits with permission of department. Prerequisites: Departmental permission. Repeatable to 9 credits.

MGMT 585. Advanced Strategic Management. 3 Credits.
An integrating course designed to develop coordinating ability and experience in the decision-making process. Taught from the point of view of the top management and by the case method, the course develops understanding of an overall point of view, through analysis of actual business situations, and an appreciation of the relations of the production department to other departments and to the business as a whole. Concluding cases place emphasis on the responsibilities of business enterprise to the community and to society generally. Prerequisites: ACCT 509, MGMT 515, MRKT 510 and FIN 501, or consent of instructor.

MGMT 596. Individual Research. 2-4 Credits.
Repeatable to 3 credits.

MGMT 597. Readings in Management. 1-3 Credits.
Repeatable. S/U grading.

MGMT 996. Continuing Enrollment. 1-12 Credits.
Repeatable to 12 credits. Prerequisites: BADM 502 and consent of instructor.

MGMT 595. Graduate Readings in Marketing. 1-3 Credits.
Repeatable to 6 credits. Prerequisite: MRKT 305.

MGMT 540. Marketing Seminar. 3 Credits.
Graduate standing.

Undergraduate Courses for Graduate Credit

MGMT 400. Organizational Theory and Analysis. 3 Credits.
The course is designed to acquaint students with some of the alternative ways in which organizations may be designed to accomplish their tasks. The course reviews the development of organization theories, their current status, and their future. Emphases are placed on the analyses of system theories pertaining to structure, process, and context. Prerequisites: MGMT 300 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. Prerequisite or Corequisite: MGMT 310 with grade of C or better. F.S.

MGMT 407. Wage and Salary Administration. 3 Credits.
The role of a wage and salary administrator is studied. The course focuses on the fundamentals of wage theory, job evaluation and pricing, employee evaluation, individual and group incentive plans, benefits, and managerial/executive compensation. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. F.

MGMT 408. Issues in Human Resource Management. 3 Credits.
This course is designed to facilitate a more in-depth study of selected issues confronting organizations in the area of personnel administration. Treatment of these issues will be accomplished utilizing some combination of the following methods: extensive reading and class discussion, individual student reports, case study analysis, and/or individual student projects. Prerequisites: MGMT 302 with grade of C or better, Junior or Senior standing, and declared COBPA majors only. F.

MGMT 409. Union-Management Relations. 3 Credits.
This course provides the student with an overview of the role of labor unions in contemporary organizations. The primary emphasis of the course is on the collective bargaining process. Students are engaged in simulated collective bargaining processes involving negotiations, mediation, arbitration, and final contractual agreements. Causes of industrial disputes and grievance arbitration are also covered. Prerequisites: MGMT 302, Junior or Senior standing, and declared COBPA majors only. S.

MGMT 420. Multinational Management. 3 Credits.
This course is an introduction to the dynamics of management processes encountered in a multinational business setting. It covers comparative management systems and analysis of various environmental conditions for making effective managerial decisions within a multinational company. Adaptation to different cultures is emphasized as one of the essential components of the successful multinational management equation. Prerequisites: MGMT 300, FIN 510, Junior or Senior standing, and declared COBPA majors only. F.

MRKT Courses

MRKT 510. Strategic Market Planning. 3 Credits.
This course is designed to facilitate an understanding of strategic market planning, with specific emphasis on decisions relating to marketing management. Students will develop an understanding of marketing as both a corporate function and a strategic/tactical managerial activity. Specifically, students will develop a realistic logic and application for marketing management and how marketing strategy is informed by marketing research. Special attention will be given to the marketing function as it impacts customer metrics and organizational performance. Prerequisite: BADM 500. F.S.

MRKT 530. Strategic Relationship Marketing. 3 Credits.
This course is designed to facilitate an understanding of strategic relationship marketing with a significant focus on organizational performance and the accountability of the marketing function. Throughout the course, attention will focus on the relational nature of B2B, B2C, and C2C marketplaces and the impacts of firm level marketing decisions upon firm performance measures (KPIs such as market share, sales, profit, call center productivity and efficiency, and customer satisfaction/loyalty). Macro topics covered include relationship, differential advantage, segmentation, buyer behavior, marketing research, demand forecasting, and marketing planning. Specific strategic and tactical decisions examined include the relational outcomes of R&D expenditures, conducting and interpreting marketing research, and marketing mix elements of products, pricing, distribution, sales force and communications decisions. In sum, this course is designed to provide a strategic relational paradigm for understanding B2B, B2C and C2C marketing and provide a "hands on" learning experience in marketing analysis, planning, and decision making towards the end goals of overall firm performance and customer satisfaction. Prerequisite: Graduate standing.

MRKT 540. Marketing Seminar. 3 Credits.
Emerging topics in the field of marketing. Prerequisite: MRKT 305.

MRKT 575. Special Topics. 3 Credits.
Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of 9 credits with permission of department. Prerequisites: Departmental permission is required. Repeatable to 9 credits.

MRKT 592. Graduate Readings in Marketing. 1-3 Credits.
Repeatable to 6 credits. Prerequisites: BADM 502 and consent of instructor. Repeatable to 6 credits.

MRKT 595. Graduate Readings in Marketing. 1-3 Credits.
Repeatable to 6 credits. Prerequisites: Consent of instructor is required. Repeatable to 6 credits.

MRKT 996. Continuing Enrollment. 1-12 Credits.
Repeatable.

MRKT 997. Independent Study. 2 Credits.

MRKT 998. Thesis. 1-15 Credits.

Chemistry

http://www.und.edu/dept/chem/mainpage.html

FACULTY: H. Abrahamson (Chair), Chu, Delhomelle, Du, Hoffmann, Kozlik, Kubatova, Pierce, Smoljakova, Stahl, Thomasson (Graduate Director) and Zhao

Associate Members of the Graduate Faculty: J. Abrahamson
Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with majors in inorganic chemistry, organic chemistry, physical chemistry, and analytical chemistry. The department offers a B.S./M.S. program (using the non-thesis M.S. option) for students who meet the admission criteria listed below.


Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Thesis Option

Mission Statement and Program Goals

The mission of the Department of Chemistry graduate M.S. program is to provide quality learning experiences in both hands-on laboratory research and classroom settings to post-baccalaureate students. These experiences will establish critical thinking based on the theory, principles, and techniques of chemistry. Graduates will be prepared to work as independent professional researchers in chemistry capable of contributing to the original literature.

Goal 1: Learning Chemistry: Students will increase their knowledge of chemistry facts and relationships, both theoretical and practical, and significantly undertake any important task (under strategic guidance of a Ph.D. Chemist).

Goal 2: Communicating Chemistry: Students will learn to communicate effectively in writing and in oral presentations on technical topics.

Goal 3: Acting Professionally: Students will learn to act ethically and professionally, and become an independent critical thinking and professional communication skills based on the theory, principles, and techniques of chemistry. Graduates will be prepared to work as independent professional researchers in chemistry capable of contributing to the original literature.

Master of Science (M.S.)

Thesis Option

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A baccalaureate degree with a major in chemistry.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergrad work.
3. Undergraduate credit in mathematics through integral calculus.
4. One year of physics.
5. Graduate Record Examination General test for all students. (Chemistry subject test also required for all applicants without a baccalaureate degree in Chemistry.)
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science (Thesis Option) Degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemistry Department.

Thesis Option (32 credits total):

1. A minimum of 32 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institute.
4. Required Courses:
   a. CHEM 509 Graduate Seminar – 1 credit
   b. Six (6) credit hours from major sequence
   c. Analytical
      Select two of the following:
      - CHEM 541 Analytical Spectroscopy
      - CHEM 542 Electrochemical Methods
      - CHEM 543 Chromatography
   d. Inorganic
      Select one of the following:
      - CHEM 510 Intermediate Inorganic Chemistry
      - CHEM 511 Advanced Inorganic Chemistry
      - CHEM 512 Organometallic Chemistry
   e. Organic
      Select one of the following:
      - CHEM 520 Advanced Organic Chemistry I
      - CHEM 521 Advanced Organic Chemistry II
      - CHEM 522 Advanced Organic Chemistry III
   f. Physical
Select two of the following:  
CHEM 530 Chemical Thermodynamics  
CHEM 531 Chemical Dynamics  
CHEM 532 Quantum Mechanics in Chemistry  
d. Six (6) credit hours of 500-level chemistry courses from two divisions other than the major.  
e. Three (3) credit hours of additional elective coursework  
f. CHEM 599 Research 10-12 credits  
g. CHEM 998 Thesis 4-6 credits.  

1. **Combined Degree Bachelor of Science/ Master of Science (B.S./M.S.)**  

**Admission Requirements**  
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.  

1. Completed the junior year (95 semester credits) in a Chemistry baccalaureate program with cumulative and chemistry GPAs of 3.0 or better in upper division courses in an American Chemical Society (ACS) certified program.+ International degrees will be evaluated for ACS certification equivalency.  
2. One year general chemistry, one year organic chemistry, one semester analytical chemistry, and one semester physical chemistry.  
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.  
4. International applicants who have received their bachelor’s or master’s degree in the United States or English-speaking Canada are not required to submit the TOEFL or IELTS.  
5. At least one letter of recommendation must be from a chemistry faculty member.  
6. + Students will be admitted to School of Graduate Studies upon completion of 125 credits.  
   * Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.  

**Degree Requirements**  
Students seeking the Bachelor of Science combined with the Master of Science (Non-Thesis Option) Degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemistry Department.  

**Non-Thesis Option (32 credits total):**  

1. Twelve (12) credits of graduate chemistry from area of specialization. May include one 400-level course from the list below.+  
2. Nine (9) elective credits (may come from departments other than chemistry).+  
3. One (1) credit of CHEM 509 Graduate Seminar or CHEM 488 Undergraduate Seminar (taken for graduate credit).  
4. Eight (8) credits from either Co-op track or Research Track.  
5. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.  
6. Two (2) credits of CHEM 997 Independent Study. Preparation of a written independent study and oral presentation of results to advisor and interested faculty are required for successful completion of this course.  
7. A written Comprehensive Examination in area of chemistry specialization will be taken while in residence. Students will be required to pass the nationally normalized ACS exam in their area of specialization at a proficient level.  
8. Required Courses:  
   a. One (1) CHEM 509 Graduate Seminar or CHEM 488 Undergraduate Seminar (taken for graduate credit)  
   b. Two (2) credits of CHEM 997 Independent Study. Preparation of a written independent study and oral presentation of results to advisor and interested faculty are required for successful completion of this course.  
   c. Eight (8) credit hours from either Co-op track or Research Track  
   d. **Co-op Track**  
      CHEM 537 Graduate Cooperative Education  
      CHEM 599 Research  
   e. Twelve (12) credits of graduate chemistry from area of specialization. May include one 400-level course.  
   f. **Analytical**  
      CHEM 541 Analytical Spectroscopy  
      CHEM 542 Electrochemical Methods  
      CHEM 543 Chromatography  
      CHEM 441 Instrumental Analysis I - Spectroscopy  
      CHEM 442 Instrumental Analysis II - Electrochemistry  
      CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry  
   g. **Inorganic**  
      CHEM 510 Intermediate Inorganic Chemistry  
      CHEM 511 Advanced Inorganic Chemistry  
      CHEM 512 Organometallic Chemistry  
      CHEM 454 Inorganic Chemistry II  
      CHEM 455 Spectroscopy and Structure  
      CHEM 463 Advanced Synthesis Laboratory  
   h. **Organic**  
      CHEM 520 Advanced Organic Chemistry I  
      CHEM 521 Advanced Organic Chemistry II  
      CHEM 522 Advanced Organic Chemistry III  
      CHEM 455 Spectroscopy and Structure  
      CHEM 463 Advanced Synthesis Laboratory  
   i. **Physical**  
      CHEM 530 Chemical Thermodynamics  
      CHEM 531 Chemical Dynamics  
      CHEM 532 Quantum Mechanics in Chemistry  
      CHEM 470 Thermodynamics & Kinetics  
      CHEM 471 Quantum Mechanics & Spectroscopy  
   j. Nine (9) elective credits (may come from departments other than chemistry)+  
   k. * The following undergraduate courses are eligible for inclusion on graduate programs of study as long as they are NOT required for the B.S. degree. Additional assignments and higher standards of accomplishment are required of students taking these courses for graduate credit: CHEM 441 Instrumental Analysis I - Spectroscopy; CHEM 442 Instrumental Analysis II - Electrochemistry; CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry; CHEM 454 Inorganic Chemistry II; CHEM 455 Spectroscopy and Structure; CHEM 463 Advanced Synthesis Laboratory; CHEM 470 Thermodynamics & Kinetics; and CHEM 471 Quantum Mechanics & Spectroscopy. See the Undergraduate catalog for course descriptions.  
   * Requires prior approval of student’s committee.  

**Doctor of Philosophy (Ph.D.)**  

**Admission Requirements**  
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.  

1. A baccalaureate degree with a major in chemistry.  
2. Undergraduate credit in mathematics through integral calculus.
3. One year of physics.
4. Graduate Record Examination General test for all students. (Chemistry subject test also required for all applicants without a baccalaureate degree in Chemistry).
5. Students with a bachelor’s degree may be directly admitted into the Ph.D. program.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemistry Department.

The degree of Doctor of Philosophy with a major in chemistry is a research degree and is conferred only in recognition of high achievement in independent scientific research and scholarship.

A candidate for the Ph.D. degree with a major in chemistry must complete a research problem in one of the four fields of chemistry: the scope of the doctoral dissertation will be such as to require the equivalent of at least one full-time academic year of research. Some doctoral research will require a substantially longer time. This research is expected to make a significant contribution to the candidate’s chosen field of chemistry. When the major professor decides that the candidate has satisfactorily completed the research problem, the candidate, in accordance with the regulations of the University, is required to prepare a dissertation covering the research.

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.

3. Required Courses:
   a. Two (2) credits of CHEM 509 Graduate Seminar
   b. Nine (9) credits of 500-level courses from major sequence
   c. Analytical
      - CHEM 541 Analytical Spectroscopy 3
      - CHEM 542 Electrochemical Methods 3
      - CHEM 543 Chromatography 3
   d. Twelve (12) credits of elective courses (at least nine must be 500-level Chemistry courses; six of these nine must be taken in two divisions other than the major).
   e. CHEM 599 Research 55-57 credits
   f. CHEM 999 Dissertation 10-12 credits

1. Courses

CHEM 508. Departmental Lecture. 1 Credit.
S/U grading.

CHEM 509. Graduate Seminar. 1 Credit.
Student presentation of a seminar based on current peer-reviewed literature.

CHEM 510. Intermediate Inorganic Chemistry. 3 Credits.
Review of atomic concepts, molecular topologies, and symmetry. Theories of bonding including directed and undirected atomic orbital view. An introduction to the chemistry of transition metals. Prerequisite: CHEM 454 or an equivalent approved by the department.

CHEM 511. Advanced Inorganic Chemistry. 3 Credits.
Structure of coordination compounds, mechanisms of inorganic reactions, biochemical applications of inorganic chemistry. Three hours lecture per week. Prerequisite: CHEM 510.

CHEM 512. Organometallic Chemistry. 3 Credits.
Preparation, bonding and reactivity of organometallic compounds, both main group and transition metal. Prerequisite: CHEM 454.

CHEM 519. Special Topics in Inorganic Chemistry. 1-3 Credits.
Topic of current interest to be considered each semester; may be repeated for credit if topic is different. Prerequisite: CHEM 510. Repeatable.

CHEM 520. Advanced Organic Chemistry I. 3 Credits.
Reaction mechanisms. Carbanions and radicals. Substitution, elimination and addition reactions. Carbonyl chemistry. Three hours lecture per week. Prerequisite: CHEM 352 or an equivalent approved by the department.

CHEM 521. Advanced Organic Chemistry II. 3 Credits.
Carbocations and carbenes. Oxidations and reductions. Alkylations. Carbonyl additions. Substitution and addition reactions. Three hours lecture per week. Prerequisite: CHEM 352 or an equivalent approved by the department.

CHEM 522. Advanced Organic Chemistry III. 3 Credits.
Photochemistry. Concerted reactions and cycloadditions. Aromatic and heterocyclic chemistry. Transition metals in organic chemistry. Three hours lecture per week. Prerequisite: CHEM 520 or CHEM 521.

CHEM 529. Special Topics in Organic Chemistry. 1-3 Credits.
Topic of current interest. May be repeated for credit if topic is different. Prerequisite: CHEM 520 or CHEM 521. Repeatable.

CHEM 530. Chemical Thermodynamics. 3 Credits.
Application of classical and statistical thermodynamics to chemical equilibrium, phase equilibrium and the physical properties of solutions. Three hours lecture. Prerequisite: CHEM 465 or an equivalent approved by the department.

CHEM 531. Chemical Dynamics. 3 Credits.
Study of the kinetics of complex, coupled chemical reactions in gas and solution phases; dynamics of gas phase reactions. Three hours lecture. Prerequisite: CHEM 465 or equivalent or consent of instructor.

CHEM 532. Quantum Mechanics in Chemistry. 3 Credits.
Application of the time-dependent Schroedinger equation to rotational, vibrational and magnetic spectroscopy; selection rules. Relation of molecular structural parameters and spectroscopic measurements; principles of group theory. 3 hours lecture. Prerequisite: CHEM 464 or an equivalent approved by the department.

CHEM 534. Quantum and Computational Chemistry. 3 Credits.
Study of the electronic structure of atoms and molecules using modern approximation methods; formal aspects of various perturbation and variational techniques as applied to chemical problems. 3 hours lecture. Prerequisite: CHEM 532.

CHEM 537. Graduate Coopertive Education. 1-9 Credits.
Practical experience of applying advanced concepts in chemistry. Experience will vary from student to student and must be coordinated with co-op host. Prerequisites: Permission of Department Chair is required, MS students must have minimum of 26 credits and PhD students must have a minimum of 52 credits.

CHEM 539. Special Topics in Physical Chemistry. 1-3 Credits.
Topic of current interest. May be repeated for credit if topic is different. Prerequisite: Consent of department. Repeatable.

CHEM 541. Analytical Spectroscopy. 3 Credits.
Fundamentals of analytical spectroscopy including principles of emission spectroscopy, flame photometry, atomic absorption, infrared and Raman spectroscopy, ultraviolet/visible spectroscopy, and fluorescence. 3 hours lecture. Prerequisite: CHEM 461 or an equivalent approved by the department.
CHEM 542. Electrochemical Methods. 3 Credits.
Topics ranging from the fundamentals of electrochemistry (including thermodynamics, kinetics, and mass transfer) to applications of contemporary electroanalytical techniques such as cyclic voltammetry, digital simulation, and spectroelectrochemistry are discussed. Three hours lecture. Prerequisite: CHEM 461 or an equivalent approved by the department.

CHEM 543. Chromatography. 3 Credits.
Fundamentals of modern chromatographic techniques including principles of band broadening, gas chromatography, liquid chromatography, and representative sampling problems. Three hours lecture. Prerequisite: CHEM 461 or an equivalent approved by the department.

CHEM 549. Special Topics in Analytical Chemistry. 1-3 Credits.
Topic of current interest to be considered each semester; may be repeated for credit if topic is different. Prerequisite: CHEM 540. Repeatable.

CHEM 561A. Foundations of Chemistry for Teacher Development. 3 Credits.
Second of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: elementary principles and theories of chemistry, matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, gases. May not be used in Ph.D. or Master’s programs.

CHEM 561B. Foundations of Chemistry for Teacher Development. 3 Credits.
Continuation of CHEM 561A. Prerequisite: CHEM 561A. On demand.

CHEM 561L. Introduction to Guided Learning in Chemistry. 2 Credits.
First of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: chemical nomenclature and structure; periodicity; aqueous reactions; chemical stoichiometry; ionic and covalent bonding; solutions; thermochemistry; gases, liquids and solids; and pedagogical issues. May not be used in Ph.D. or Master’s programs.

CHEM 562A. Intermediate Chemistry for Teacher Development. 3 Credits.
Fourth of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: Equilibrium and kinetic principles of chemistry; behavior of solutions; rates of reactions; thermodynamics; aqueous equilibria (acid/base, solubility); electrochemical cells; chemical behavior of main-group elements; nuclear chemistry. May not be used in Ph.D. or Master’s programs. Prerequisite: CHEM 562L.

CHEM 562B. Intermediate Chemistry for Teacher Development. 3 Credits.
Continuation of CHEM 562A. Prerequisite: CHEM 562A.

CHEM 562L. Intermediate Guided Inquiry Learning in Chemistry. 2 Credits.
Third of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: colligative properties; chemical kinetics and equilibrium; acid/base chemistry; thermodynamics; electrochemistry; and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisites: CHEM 561L and CHEM 561B.

CHEM 563A. Organic and Biochemistry for Teacher Development. 3 Credits.
Sixth of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: hydrocarbons; alcohols; amines; aldehydes and ketones; carboxylic acids and their derivatives; proteins; carbohydrates, lipids; nucleic acids, enzymes; generation of biochemical energy; and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisite: CHEM 563L.

CHEM 563B. Organic and Biochemistry for Teacher Development. 3 Credits.
Continuation of CHEM 563A. Prerequisite: CHEM 563A.

CHEM 563L. Guided Inquiry Learning in Organic and Biochemistry. 2 Credits.
Fifth of a chemistry course sequence intended for: a) teachers planning to qualify to teach high school chemistry; or b) teachers looking to enrich their content knowledge in chemistry for professional development. Topics include: hydrocarbons; alcohols; amines; aldehydes and ketones; carboxylic acids and their derivatives; proteins; carbohydrates, lipids; nucleic acids, enzymes; and pedagogical issues. May not be used in Ph.D. or Master’s programs. Prerequisites: CHEM 562L and CHEM 562B.

CHEM 599. Research. 1-15 Credits.
Maximum of 15 credits each semester. May be repeated for credit. Repeatable.

CHEM 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CHEM 997. Independent Study. 2 Credits.

CHEM 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

CHEM 999. Dissertation. 1-18 Credits.
Repeatable to 18 credits.

Undergraduate Courses for Graduate Credit
CHEM 471. Quantum Mechanics & Spectroscopy. 3 Credits.
Theory and nature of bonding and structure, spectroscopy, and optics. Prerequisites: CHEM 466, MATH 265, and PHYS 252. S.

Clinical Translational Science
Statement of Mission and Goals
The mission of the Clinical and Translational Science Graduate Program is to prepare its students for careers in research, teaching, and service in the interdisciplinary medical sciences. The mission is carried out with emphasis on the following goals:
1. To provide a strong foundation in the complex and interrelated fields of clinical sciences, population-based studies, outcome studies, genetic studies, environmental sciences and molecular basis of human disease.
2. To foster in students an attitude of inquiry, collaboration and interdisciplinary approaches that leads naturally to the scientific method of investigation.
3. To train students in modern methods and in data analysis which is critical for clinical, translational, and population based research.
4. To mentor students to become highly qualified researchers, educators and research oriented practitioners so that they are available for future demands in clinical and translational research and education.
5. To engender in students a spirit of cooperation for the mutual benefit of all colleagues.

The Clinical and Translational Science doctoral program exists to prepare students for self-directed, life-long learning and careers as independent scientists in Clinical and Translational sciences with a specialization in either the Molecular and Pathological Basis of Human Disease or Bioinformatics and Human Population Genetics. The program provides a quality academic curriculum that emphasizes training, mentoring, and practical experience in research and in teaching.

Program goals
The Clinical and Translational Science Master’s program exists to prepare students for life-long learning and careers in research and teaching. The program provides a quality academic curriculum that emphasizes education and research in the area of Clinical and Translational Sciences with emphasis on human disease.

Goal 1: Students will possess and be capable of applying knowledge and understanding of the Clinical and Translational Sciences as they encounter new or unfamiliar problems in broader contexts related to their field of study.

Goal 2: Students will demonstrate the ability to develop and apply ideas in a research context.
Goal 3: Students will possess communication skills necessary to relate the results and conclusions of their research clearly and convincingly.

Goal 4: Students will recognize and adhere to ethical principles, exhibit professional behavioral standards, and fulfill their professional responsibilities to their institution, the scientific community and society in general.

Master of Science

Admission Requirements

The application process occurs through the School of Graduate Studies. Information is available from the UND School of Graduate Studies website (http://www.und.edu/dept/grad) (http://graduateschool.und.edu/).

If further advice or help would be beneficial to an applicant’s decision-making process, we encourage her or him to contact our Director of Graduate Education.

1. Completion of a four-year degree from an accredited university. We are particularly interested in students who have completed an undergraduate degree within the state of North Dakota.
2. Coursework: Admission into the graduate program offered through our department is dependent upon the applicant’s demonstration of effective academic skills and appropriate undergraduate training.

Generally, the applicant will have completed successfully the following coursework:

- General Biology or Zoology (one year sequence)
- General Chemistry (one year sequence)
- Organic Chemistry
- College Algebra

Coursework in Physics, Molecular Biology, or Genetics is strongly recommended.

Preference for admission may be given to applicants who have completed coursework in at least one of the following areas: Biology, Cell Biology, Chemistry, Biochemistry, or Medical Laboratory Sciences.

Applicants must have a cumulative undergraduate GPA of at least 2.75 and a cumulative GPA of 3.00 in graduate level course work, if applicable. Since the Graduate School requires a 3.0 for admission, those individuals with GPA less than 3.0 would have to be admitted under provisionary status.

1. Graduate Record Examination Scores: Applicants must submit Graduate Record Examination (General Test) scores. Preference for admission will be given to applicants whose test scores fall at or above the reported national averages or 50th percentiles.
2. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
3. Admission to the Clinical and Translational Science Graduate Program can be made either through the MS degree program or by application directly to the PhD degree program. Students who elect to begin the MS degree program and later decide they wish to pursue the PhD degree may choose to attempt to bypass the MS degree by taking the comprehensive examination. By passing it and meeting the other requirements, such as a GPA of 3.0 or higher in graduate level coursework, a student may be admitted to the PhD program without completing the MS program. Otherwise, a student admitted to the MS program must complete the degree as listed.

Degree Requirements

Students seeking the Master of Science degree through the Clinical and Translational Science Graduate program at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the program.

1. Minimum of 38 semester hours of graduate credit.
2. Completion of the following graduate level courses (minimum 38 credits):

Foundational Coursework to be completed by all CTS graduate students:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIMD 510</td>
<td>Basic Biomedical Statistics</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 516</td>
<td>Responsible Conduct of Research</td>
<td>2</td>
</tr>
<tr>
<td>PATH 500</td>
<td>Biochemistry and Cell Biology</td>
<td>6</td>
</tr>
<tr>
<td>PATH 505</td>
<td>Seminar in Clinical and Translational Science</td>
<td>1</td>
</tr>
<tr>
<td>PATH 590</td>
<td>Readings</td>
<td>1-3</td>
</tr>
<tr>
<td>PATH 593</td>
<td>Research</td>
<td>1-6</td>
</tr>
<tr>
<td>PATH 998</td>
<td>Thesis</td>
<td>1-9</td>
</tr>
</tbody>
</table>

A minimum of 4 credits of elective coursework is required for all MS in CTS students. Available elective coursework will vary based on track.

For students in the Pathogenesis of Human Disease track, a minimum of 4 hours of elective courses selected from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBIO 509</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 517</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PATH 590</td>
<td>Readings</td>
<td>1-3</td>
</tr>
<tr>
<td>PATH 591</td>
<td>Special Topics</td>
<td>1-4</td>
</tr>
<tr>
<td>PATH 591</td>
<td>Special Topics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

For students in the Bioinformatics and Human Population Genetics track, a minimum of 4 hours of elective courses selected from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPH 532</td>
<td>Biostatistics 2</td>
<td>3</td>
</tr>
<tr>
<td>MPH 534</td>
<td>Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>MPH 535</td>
<td>Health Care Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>MPH 590</td>
<td>MPH Seminar</td>
<td>1</td>
</tr>
<tr>
<td>PATH 591</td>
<td>Special Topics (Human Population Genetics)</td>
<td>2</td>
</tr>
<tr>
<td>PATH 591</td>
<td>Special Topics (Scientific Writing)</td>
<td>1</td>
</tr>
</tbody>
</table>

- MPH 531 Biostatistics 1 must be completed as a pre-requisite for MPH 532 Biostatistics 2; MPH 531 Biostatistics 1 will not count toward the 4 hours of required elective coursework for this specialization, but can be substituted for the required foundational course BIMD 510 Basic Biomedical Statistics.

3. Other graduate level courses may be selected or substituted if approved by the graduate student’s Faculty Advisory Committee. Elective courses chosen should be appropriate to the student’s area of interest.


Doctor of Philosophy

Admission Requirements

The application process occurs through the School of Graduate Studies. Information is available from the UND School of Graduate Studies website (http://www.und.edu/dept/grad) (http://graduateschool.und.edu/).

If further advice or help would be beneficial to an applicant’s decision-making process, we encourage her or him to contact our Director of Graduate Education.

1. Completion of a four-year degree from an accredited university. We are particularly interested in students who have completed an undergraduate degree within the state of North Dakota.
2. Coursework: Admission into the graduate program offered through our department is dependent upon the applicant’s demonstration of effective academic skills and appropriate undergraduate training.

Generally, the applicant will have completed successfully the following coursework:

- General Biology or Zoology (one year sequence)
- General Chemistry (one year sequence)
- Organic Chemistry
- College Algebra
Coursework in Physics, Molecular Biology, or Genetics is strongly recommended.

Preference for admission may be given to applicants who have completed coursework in at least one of the following areas: Biology, Cell Biology, Chemistry, Biochemistry, or Medical Laboratory Sciences.

Applicants must have a cumulative undergraduate GPA of at least 2.75 and a cumulative GPA of 3.00 in graduate level course work, if applicable. Since the Graduate School requires a 3.0 for admission, those individuals with GPA less than 3.0 would have to be admitted under provisional status.

1. Graduate Record Examination Scores: Applicants must submit Graduate Record Examination (General Test) scores. Preference for admission will be given to applicants whose test scores fall at or above the reported national averages or 50th percentiles.

2. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

3. Admission to the Clinical and Translational Science Graduate Program can be made either through the MS degree program or by application directly to the PhD degree program. A MS degree is not required for admission into the PhD degree program.

4. Students who elect to begin the MS degree program and later decide they wish to pursue the PhD degree may choose to attempt to bypass the MS degree by taking the comprehensive examination. By passing it and meeting the other requirements, such as a GPA of 3.0 or higher in graduate level coursework, a student may be admitted to the PhD program without completing the MS program. Otherwise, a student admitted to the MS program must complete the degree as listed.

Degree Requirements

The graduation requirements for the Ph.D. degree in the Clinical and Translational Sciences Program consist of required and elective coursework and research leading to the preparation of a dissertation and scholarly tools.

1. Minimum of 90 semester hours of graduate credit.

2. Completion of the following graduate level courses (90 credits):

   Foundational Coursework to be completed by all CTS graduate students:

   - BIMD 510 Basic Biomedical Statistics 2
   - BIMD 516 Responsible Conduct of Research 2
   - PATH 500 Biochemistry and Cell Biology 6
   - PATH 505 Seminar in Clinical and Translational Science 1
   - PATH 590 Readings 1-3
   - PATH 591 Special Topics 1-4
   - PATH 593 Research 1-6
   - PATH 999 Dissertation 1-15

For the Pathogenesis of Human Disease Specialization, the following are required core courses:

- MBIO 509 Immunology 3
- ANAT 517 3
- PATH 575 Molecular and Pathological Basis of Human Disease 4
- PATH 591 Special Topics 1-4

Students in the Pathogenesis of Human Disease Specialization are required to take a minimum of 4 hours of elective courses:

Examples:
- Breast Disease, 1 cr
- Urinary Disease, 1 cr
- Human Population Genetics, 2 cr
- Metals, 2 cr
- Other available, 1-4 cr

For the Bioinformatics and Human Population Genetics Specialization, the following are required core courses:

- MPH 531 Biostatistics 1 * 3
- MPH 532 Biostatistics 2 3
- MPH 534 Bioinformatics 3
- MPH 535 Health Care Data Mining 3

* MPH 531 Biostatistics 1 can be substitute for the required foundational course BIMD 510 Basic Biomedical Statistics.

Students in the Bioinformatics and Human Population Genetics Specialization are required to take a minimum of 5 hours of elective courses from the following:

- PATH 591 Special Topics 1-4
- MPH 533 Advanced Biostatistics 3
- PATH 590 Readings 1-3
- PATH 591 Special Topics 1-4

3. Other graduate level courses may be selected or substituted if approved by the graduate student’s Faculty Advisory Committee. Elective courses chosen should be appropriate to the student’s area of interest.

4. Scholarly Tools: All candidates for the PhD degree must demonstrate competence in the scholarly tools for study and research in the Clinical and Translational Science Graduate Program. Each department at UND is responsible for setting up its own “Scholarly Tool” requirements. These requirements must be completed before the student is permitted to take the comprehensive examination or becomes a candidate for the PhD degree. For the CTS program BIMD 510 Basic Biomedical Statistics meets the scholarly tool requirement.

5. Research and Dissertation: The PhD degree in Clinical and Translational Sciences requires completion of a dissertation based on the results of a research project completed by the graduate student under the guidance of a faculty advisor. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be published in a refereed scientific journal before graduation or at least accepted for publication. The candidate must make a significant contribution to the advancement of knowledge in the field. The dissertation prepared by the candidate must be presented and defended before the Advisory Committee and the Clinical and Translational Sciences Graduate Faculty

Courses

PATH 490. Directed Studies. 1-4 Credits.

Students are given an opportunity to perform research on a project related to research of any of the faculty members in CTS program. Although activities are specific to the individual faculty member, initial training usually involves pipetting, the protein assay, PCR and data presentation. Repeatable to 12 credits. S/U grading. F.S.

PATH 500. Biochemistry and Cell Biology. 6 Credits.

Knowledge in biochemistry and cell biology form the core concepts that underlay all study and research endeavors in the clinical sciences. Since the basics in these two disciplines are paramount to a successful graduate studies program, the course is designed to emphasize proficiency in basic concepts. The course is highly didactic and makes no assumptions of previous educational experiences of the incoming graduate student. This is deemed essential for a course that forms the stem in a multi-disciplinary graduate program. Thus the course is focused on basic textbook-based foundational knowledge and problem solving skills. The course begins by relating basic general and organic chemistry to biochemical systems, followed by addressing actual biochemical, synthetic and degradation reactions, and expanding this to the macromolecular and cell biological components of the process. Thus the study is first presented with the biochemical and molecular aspects of cellular processes and then uses this to build a more comprehensive picture of how molecular structures come together to forms structures visible by various forms of microscopy. F.
PATH 505. Seminar in Clinical and Translational Science. 1 Credit.
All students and faculty within the program will participate in longitudinal seminars discussing their research area and interrelationships with complimentary disciplines. This may be in form of discussions, “chalk talks” of current efforts, literature or topic review. This will give students and faculty interdisciplinary and collaborative exposure to broad areas of inquiry and foster creativity and collaboration. This course will be taken annually by all students in the CTS program. Repeatable to 11 credits. S/U grading. F,S.

PATH 575. Molecular and Pathological Basis of Human Disease. 4 Credits.
Pathogenesis of Human Disease is an advanced graduate course that is based on lectures and discussions with a strong element of self-study through the use of extensive reading materials as well as lecture videos. This course is intended to cover aspects of the fundamental molecular, cellular and pathological mechanisms underlying various human diseases while the courses offered in the various CTS 590 special topics course will focus on diseases of specific organ systems. By the end of this course the student will have demonstrated a significant knowledge base of the molecular and pathological basis of human disease that is applicable to clinical and translational research. The student will also have sufficient knowledge of pathology to be capable of teaching this material to medical, professional, and graduate students. This course is open to all graduate students in the School of Medicine and Health Sciences as well as graduate students in biological sciences enrolled at the University of North Dakota who meet the prerequisites. Prerequisites: MBIO 509, PATH 500, and ANAT 517. F.

PATH 590. Readings. 1-3 Credits.
The primary goal of this course is for students to learn critical thinking and data analysis of the literature in their field of research study. Course sections will range from general training to journal clubs with an advanced topic focus. 1-3 credits There are two modes of this course 1)CTS 590 Readings: Scientific Reading This course is designed to promote critical reading of the literature. The primary goal is to teach students the process by which scientists identify problems, formulate testable hypotheses, collect data through experiments, and eventually establish new models describing biological processes. 1 credit 2)CTS 590 Readings: Journal Club The goal of the journal club is to familiarize students with the most up-to-date scientific literature and to develop the tools necessary to be a life-long learner. Students led by a faculty facilitator will discuss experimental methods and observations and this will provide graduate students the opportunity to develop oral skills. The course will also facilitate scientific communication between various clinical disciplines. The prerequisite for this course is CTS590 Readings: Scientific Reading; or equivalent with permission from course director. Repeatable to 3 credits. S/U grading. F,S.

PATH 591. Special Topics. 1-4 Credits.
The course sections offered under Special Topics are designed to bring a wide range of advanced topic learning to students within the Clinical and Translational Science Program and are where the sub-program specialization courses will be focused. Most of these topics are advanced focus areas of pathology such as in breast or urologic disease, advanced topics in toxicology such as metals, or topics in bioinformatics such as human population genetics. Scientific writing is another special topic that is germane to all in the CTS program. Topic areas will be advertised the semester previous to being offered. Prerequisite: PATH 500 and PATH 575. Repeatable to 8 credits. F,S.

PATH 593. Research. 1-6 Credits.
Research experience is offered in the specialty fields of the faculty within the Clinical and Translational Science Program and involves an intensive research experience on a variety of unique research problems utilizing modern methods and tools. Credits arranged (generally 1-6 credits per semester). Repeatable. F,S,SS.

PATH 996. Continuing Enrollment. 1-12 Credits.
This course is designed to allow the student to continue working on their thesis or dissertation when all the Research Credits have been used up. Repeatable to 12 credits. S/U grading. F,S,SS.

PATH 998. Thesis. 1-9 Credits.
The course is to enable the student time to complete the thesis or dissertation in the event that student has already used up all the required courses to the maximum extent before graduating. Repeatable to 9 credits. S/U grading. F,S,SS.

PATH 999. Dissertation. 1-15 Credits.
This required course is taken in the students last semester(s) as they prepare their doctoral dissertation. Progress will be overseen by the student’s faculty advisor in the Clinical and Translational Program. Repeatable to 15 credits. F,S,SS.
Degree Requirements

Students seeking the Master of Art degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Communication Program.

Required core courses for all Communication Master’s students:

- COMM 501 Theoretical Perspectives in Communication 3
- COMM 505 Concepts in Quantitative Communication Research 3
- COMM 506 Concepts in Qualitative Communication Research 3

Thesis Option

Students choosing the thesis option must meet the following requirements:

1. A minimum of 30 credits in communication are required if a minor or cognate is not chosen.
2. The coordinator of graduate studies appoints a three-person advisory committee from the Graduate Faculty, normally drawn from the Communication Program and chaired by the student’s adviser.
3. Candidates are administered written comprehensive examinations after the completion of 18 hours of graduate credit.
4. Thesis topics must be approved by the student’s faculty advisory committee, with research conducted under the guidance of the student’s faculty advisory committee, then completed to the satisfaction of the faculty advisory committee with a final oral examination.

Non-Thesis Option with Professional Portfolio

Students choosing the non-thesis option whose final project is a professional portfolio must meet the following requirements:

1. A minimum of 32 credits in communication are required if a minor or cognate is not chosen.
2. The coordinator of graduate studies appoints a four-person advisory committee comprised of three Graduate Faculty, normally drawn from the Communication Program and chaired by the student’s adviser, plus an external professional member to the committee who serves in an advisory capacity only.
3. Candidates will be expected to prepare a professional portfolio to be examined by their advisory committee.
4. Portfolio content must be approved by the student’s advisory committee, completed under the guidance of the student’s advisory committee, with a review of the completed professional portfolio to the satisfaction of the advisory committee.

A Minor or Cognate Option

1. If a minor or cognate is approved by a student’s faculty advisory committee, the student will be required to take the same amount of credits required for a major (30 credits for the thesis option or 32 credits for the non-thesis option with professional portfolio) with a minimum of 20 credits in communication and a minimum of 9 credits in a minor or cognate.

Doctor of Philosophy (Ph.D.)

Admission Requirements

Admission Requirements for consideration for the Doctor of Philosophy degree in the Communication Program include:

1. Cumulative undergraduate GPA of 3.0 or higher OR MA degree in Communication
2. Statement of interest, including personal goals and the relevance of the Ph.D. in Communication to those goals.
3. Original academic paper, 10-15 pages in length, reflecting the student’s ability to articulate and synthesize ideas.
4. Three letters of recommendation from sources familiar with the applicant’s potential as a doctoral student in Communication.
5. Graduate Record Examination General Test.
6. To be considered for a teaching assistantship, the student must submit a statement of teaching philosophy and letters of recommendation must address the student’s teaching abilities.
7. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Note: Students whose native language is not English are not permitted to hold teaching assistantships unless they have attained a score of at least 50 on the SPEAK (Speaking Proficiency English Assessment Kit) or the TSE (Test of Spoken English). The test is administered at the University, after the student arrives on campus.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Communication Program.

Requirements for the Doctor of Philosophy Degree set forth by the Communication Program include:

1. Completion of 90 semester credit hours beyond the baccalaureate degree.
2. To be considered for a teaching assistantship, the student must submit a statement of teaching philosophy and letters of recommendation must address the student’s teaching abilities.
3. Elective Requirements from COMM (minimum of 21 credits chosen from the list below)

- COMM 512 Communication Ethics, Law, and Regulation 3
- COMM 515 International and Intercultural Narrative Communication 3
- COMM 525 Interpersonal Relations and Communication 3
- COMM 528 Intercultural Global Conflict 3
- COMM 530 Gender, Culture, and Communication 3
- COMM 533 Communication and International Development 3
- COMM 538 International Media 3
- COMM 540 Communication and Organizations 3
- COMM 543 International and Intercultural Indigenous Communication 3
- COMM 549 Communication Technologies, Society, & Diversity 3
- COMM 570 Seminar in Communication 3
4. Additional Electives (minimum of 15 credits chosen from the list below)

Remaining courses from COMM electives above

- COMM 591 Individual Readings and Research may be taken at discretion of Committee
5. Completion of a non-thesis MA research project (9 credits: these may be taken as COMM 997 Credits)
6. Comprehensive Examination
7. Dissertation (15 cr)

Courses

COMM 501. Theoretical Perspectives in Communication. 3 Credits.
Course provides a conceptual and historical overview of Communication Studies, paying special attention to questions of epistemology. F.
COMM 505. Concepts in Quantitative Communication Research. 3 Credits.
In the two-part 505/506 course, students focus on honing their understanding of the quantitative/qualitative paradigm in Communication research. While this course section focuses on the various methods that fall under the labels of qualitative, both portions of the course seek to identify possible points of connection and resistance across the spectrum of methodological choices and require participation in Communication Program colloquium series. F, odd years.

COMM 506. Concepts in Qualitative Communication Research. 3 Credits.
In the two-part 505/506 course, students focus on honing their understanding of the qualitative/quantitative paradigm in Communication research. While this course section focuses on the various methods that fall under the labels of qualitative, both portions of the course seek to identify possible points of connection and resistance across the spectrum of methodological choices and require participation in Communication Program colloquium series. F, even years.

COMM 512. Communication Ethics, Law, and Regulation. 3 Credits.
Focuses on the ethical foundations of media law and communication public policy.

COMM 515. International and Intercultural Narrative Communication. 3 Credits.
This course examines narration or narrative communication within and between cultures and nations. Narration and communication theory and practice are explored for content and used as method. Assessing narrative communication in terms of international and intercultural comprehension and acceptance is addressed. On demand.

COMM 525. Interpersonal Relations and Communication. 3 Credits.
Face-to-face and mediated transactions between two people or people in small groups in diverse settings. Deals with inquiry, conflict management, interpersonal sensitivity, individuality, and conformity.

COMM 528. Intercultural Global Conflict. 3 Credits.
Communication patterns and processes can both facilitate conflict and terrorism as well as reduce discord and violence. Communication and conflict theory and research are examined in a global context with implications for terrorism, insurgency, and violence. Intergroup communication as well as communication strategies for mitigating discord and enhancing violence reduction are considered. On demand.

COMM 530. Gender, Culture, and Communication. 3 Credits.
An examination of how males and females from different cultural, ethnic and national backgrounds use, and are portrayed by, communication institutions and processes. Covers issues of representation, identity and difference.

COMM 533. Communication and International Development. 3 Credits.
This course introduces students to theoretical foundations of historical and contemporary issues in communication, media, information and international development. 21st century dynamic geopolitical processes are studied in relation to the issues of state-building, modernization, dependency, and globalization. On demand.

COMM 535. Intercultural Communication. 3 Credits.
This course incorporates critical conceptualizations of identity, “the Other”, and multiculturalism. It explores theoretical reflections of the symbolic systems of unfamiliar cultures, and the emergence of mutual understanding.

COMM 538. International Media. 3 Credits.
This course provides a comparison of media systems, media flows, and communication among countries. Both theoretical and ethnographic perspectives are considered by examining global media patterns and local flows through particular cultures around the world. The theoretical approaches of hybridism and post-colonialism are applied. On demand.

COMM 540. Communication and Organizations. 3 Credits.
Examines the general communication processes and dynamics within and among organizations and explores the dynamics in network organizations, with a particular focus on communication in interpersonal groups and inter-organizational working teams. Theories of power and politics in and among organizations, as well as of decision-making, conflict management, and strategic communication are explored.

COMM 543. International and Intercultural Indigenous Communication. 3 Credits.
This course examines communication within and between indigenous and non-indigenous people internationally, interculturally, and interlinguistically. Ramifications and conceptualizations related to comprehension and acceptance in communicating within and between indigenous people in international and intercultural settings is addressed. On demand.

COMM 549. Communication Technologies, Society, & Diversity. 3 Credits.
A critical study of theoretical components of the so-called “Information Society,” which addresses the interaction of communication technologies with individuals, communities, economies, and cultures. This course focuses on aspects of technological change, new patterns of global connectedness, and their implications for emerging global paradigms. On demand.

COMM 550. International and Global Communication. 3 Credits.
An analysis of international media, comparative telecommunications systems and globalization. Covers issues such as transnational communication, global journalism, satellite broadcasting and communication in diplomacy and international affairs.

COMM 570. Seminar in Communication. 3 Credits.
In-depth studies in specific communication areas such as relational communication, rhetoric and public discourse, intercultural/international communication. May be repeated for credit with change of topic (up to 15 hours). Repeatable to 15 credits.

COMM 591. Individual Readings and Research. 3 Credits.
Directed readings and research in speech communication and mass communication topics and issues. May be repeated to a total of 12 credits. 3 credit limit per semester. Repeatable to 12 credits.

COMM 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

COMM 997. Independent Study. 2 Credits.

COMM 998. Thesis. 1-4 Credits.
4 credits required for thesis option. Repeatable to 9 credits.

COMM 999. Dissertation. 1-15 Credits.
Repeatable to a maximum of 15 credits. Repeatable to 15 credits.

Undergraduate Courses for Graduate Credit

COMM 310. Media and Diversity. 3 Credits.
Study of minority status within mass media organizations and in media content from historical, contemporary and speculative points of view. F.

COMM 401. Organizational Communication. 3 Credits.
Analysis of communication behavior in formally structured relationships as it relates to the organization and to individuals. Special attention given to organizational style, status, trust and conflict-management. Informal communication networks and rumor are studied. S.

COMM 402. Intercultural/International Communication. 3 Credits.
This course will provide an overview of the study of intercultural and international communication. Topics addressed will include: history, literature, and culture of specific groups including racial, religious, and ethnic issues that affect communication patterns and outcomes. S.

COMM 404. Advertising and Society. 3 Credits.
Examines and evaluates the social, ethical and economic aspects of advertising. Attention is given to appraising the effects of advertising on the consumer and competition. F.

COMM 405. Social Implications of the Information Society. 3 Credits.
Considers and evaluates different perspectives on the information society, ranging from humanistic and Neomarxist critiques to the optimistic scenarios of some futurists. Examines the implications of new means of creating, storing, manipulating and disseminating information. Discussion of whether or not the potential benefits will be realized. S.

COMM 428. Media History. 3 Credits.
Origins and evolution of human communication, mass media and related technological innovations. Addresses mass media’s historical influence on social, political and economic change, as well as on maintaining the status quo. S.
Communication Sciences and Disorders

http://www.und.edu/dept/cdiss/index.html

FACULTY: Cummings, Foley, Madden, Paulson, Rami (Graduate Director & Chair), Robinson, Seddoh, Steen, Swisher, Weisz, and Wocken

Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Department of Communication Sciences and Disorders offers graduate programs leading to the Master of Science in Communication Sciences and Disorders.

The master’s degree program is accredited by the Council on Academic Accreditation in Speech-Language Pathology and Audiology. A graduate degree is required for students planning a career in speech-language pathology and audiology. It is anticipated that graduates with a master’s degree will meet the academic and practicum requirements for the Certificate of Clinical Competence of the Boards of Examiners in Speech-Language Pathology and Audiology. The Master of Science degree with thesis or without thesis is available with a major emphasis in Speech-Language Pathology and with supporting work in Audiology.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Mission Statement and Program Goals

The larger mission of the Department of Communication Sciences and Disorders (CSD) is to provide its students with a liberal arts education through the College of Arts and Sciences, including instruction in the arts and sciences, communication skills, habits of independent thought, and the understanding of diverse cultures. The specific mission of CSD is to provide academic and clinical instruction, supervised clinical practical, and research experience for students that will lead to state, regional and national accreditation and supporting work in Audiology.

This mission is directed at meeting the interests and needs of the University of North Dakota constituency.

The larger mission of the Department of Communication Sciences and Disorders is to provide academic and research experience for students that will lead to state, regional and national accreditation and supporting work in Audiology. A graduate degree is required for students planning a career in speech-language pathology and audiology. It is anticipated that graduates with a master’s degree will meet the academic and practicum requirements for the Certificate of Clinical Competence of the Boards of Examiners in Speech-Language Pathology and Audiology.

The specific mission of CSD is to provide academic and clinical instruction, supervised clinical practical, and research experience for students that will lead to state, regional and national accreditation and supporting work in Audiology.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Graduate Record Examination—General Test.
2. Overall undergraduate GPA of at least 2.75 and a 3.00 in the courses required for an undergraduate major in Communication Sciences Disorders.
3. Admittance to approved status typically requires an undergraduate major in Communication Sciences Disorders.
4. Those admitted to Qualified Status must have at least 12 semester credits of undergraduate work in the field, but will be required to complete the coursework for the undergraduate major.
5. Criteria used in admission decisions:
   a. Scores on the Graduate Record Examination General test;
   b. All grade point averages from previous undergraduate, post-baccalaureate and graduate studies;
   c. The extent and quality of previous clinical, research, and service activities; and
   d. Quality of speaking, writing, and interpersonal skills.

6. Applicants should include documentation of their qualifications relative to the criteria above.
7. Admissions for summer and fall enrollment and the award of financial aid will be based on applications completed by January 15.
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Communication Sciences and Disorders Department.

Thesis Option:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Required CSD Courses:

   5. CSD 525 Introduction to Research in Speech-Language Pathology and Audiology 3
   CSD 530 Audiology for SLPs 1
   CSD 532 Neurogenic Communication Disorders I 3
   CSD 533 Investigations in Child Language 3
   CSD 534 Advanced Management of Articulation and Phonological Disorders 2
   CSD 536 Stuttering Intervention 2
   CSD 538 Management of Pharyngeal Disorders 3
   CSD 542 Neurogenic Communication Disorders II 3
   CSD 550 Motor Speech Disorders 2
   CSD 551 Dysphagia 2
   CSD 583 Evaluation and Service Delivery 3
   CSD 584 Advanced Clinical Practicum 1-16
   CSD 572 Neurogenic Communication Disorders IV 3

Scholarly Tools

   EFR 515 Statistics I 3

School Practicum

   CSD 585 Practicum in the School Setting 10

Electives

   CSD 595 Research Problems in Speech-Language Pathology-Audiology 1-3
   CSD 597 Special Problems in Communication Disorders 1-3

Thesis

   CSD 998 Thesis 4

Total Credits 51-70

Non-Thesis Option:

1. Thirty-two (32) credits including required credits for the major.
2. A minimum of two credits of Independent Study.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.
7. Required CSD Courses:

   8. CSD 525 Introduction to Research in Speech-Language Pathology and Audiology 3
   CSD 530 Audiology for SLPs 1
   CSD 532 Neurogenic Communication Disorders I 3
   CSD 533 Investigations in Child Language 3
   CSD 534 Advanced Management of Articulation and Phonological Disorders 2
Students wishing to qualify for employment in a school setting must complete requirements for a teaching credential as a graduate student. These include School Program in CSD, and. Students must also take the Praxis I Teacher Certification Examination.

Graduate Students already having a teaching credential with some other major must take T&L 400 Methods and Materials and practicum in a school before being recommended for employment in a school.

**Doctor of Philosophy (Ph.D.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. A master’s degree in communication sciences and disorders, speech-language pathology, audiology, speech and hearing science, or a related field.
2. Graduate Record Examination-General Test.
3. An overall grade point average of 3.0, on a 4.0 scale, in graduate coursework in speech-language pathology, audiology, or a related area.
4. Criteria used in admission decisions:
   a. Scores on the Graduate Record Examination General Test;
   b. All grade point averages from previous undergraduate, post-baccalaureate and graduate studies;
   c. The extent and quality of previous clinical, research, and service activities; and
   d. Quality of speaking, writing and interpersonal skills.
5. Applicants should include documentation of their qualifications relative to the criteria above.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
7. Applications must be submitted by February 1 to be considered for financial aid for the following fall semester.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Communication Sciences and Disorders Department.

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
4. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree may be transferred from another institution.
5. At least one-half of the work must be in the major field.
6. Successful completion of a comprehensive examination.
7. Required Courses:

**Courses**

**CSD 501. Seminar in Speech-Language Pathology and Audiology. 1-3 Credits.**

A study of the application of current and emerging data in the area of clinical assessment and management of speech disorders, language disorders, or disorders of hearing, in children and adults with communication impairments. May be repeated as topics change. Prerequisite: Consent of instructor. Repeatable.

**CSD 525. Introduction to Research in Speech-Language Pathology and Audiology. 3 Credits.**

Research methods in Speech-Language Pathology and Audiology. Steps in research before data analysis is undertaken. Culminates in a research proposal.

**CSD 530. Audiology for SLPs. 1 Credit.**

Diagnosis and management of auditory disorders. Prerequisites: CSD 431 and CSD 434, F, SS.

**CSD 532. Neurogenic Communication Disorders I. 3 Credits.**

Study of the representation or organization of language in the human brain as determined by multidisciplinary techniques such as neuroimaging, electrical stimulation mapping, etc. Includes aphasia and communication disturbance in adults following traumatic injury to the brain, and also clinical management. Prerequisites: CSD 231 and CSD 422.
CSD 533. Investigations in Child Language. 3 Credits.
Student formulation of questions and concerns about normal and disordered child language which are studied through a search of pertinent literature and through observation and analysis of children's linguistic production. Prerequisites: CSD 343.

CSD 534. Advanced Management of Articulation and Phonological Disorders. 2 Credits.
Advanced knowledge of articulation and phonological disorders; skills needed to assess and treat individuals with these disorders. Emphasis on childhood apraxia, velopharyngeal disorders, cognitive disorders, hearing loss, tongue thrust, dialectal differences, dysarthrias in children, and phonemic disorders concurrent with language disorders. Prerequisites: CSD 333 or equivalent.

CSD 536. Stuttering Intervention. 2 Credits.
A study of the theoretical bases for and the clinical management of stuttering in children and adults.

CSD 538. Management of Phonatory Disorders. 3 Credits.

CSD 542. Neurogenic Communication Disorders II. 3 Credits.
Assessment and intervention strategies for children with traumatic brain injury, cerebral palsy, fetal alcohol syndrome and developmental apraxia. Includes evaluation for and application of augmentative and alternative communication devices.

CSD 550. Motor Speech Disorders. 2 Credits.
The study of control and damage of speech production related to neurological diseases and lesions. Includes assessment and intervention strategies for adults with motor speech disorders such as dysarthria and apraxia of speech. Prerequisites: CSD 532 and CSD 542. SS.

CSD 551. Dysphagia. 2 Credits.
The study of normal and abnormal swallowing, swallowing disorders in children and adults including assessment and intervention strategies. Prerequisites: CSD 532 and CSD 542. F.

CSD 553. Swallowing Disorders. 2 Credits.
Prerequisites: CSD 422 and CSD 542; or equivalents.

CSD 572. Neurogenic Communication Disorders IV. 3 Credits.
A study of cognitive and communication deficits that accompany right hemisphere damage, as well as traumatic brain injury, their diagnosis and management. Prerequisites: CSD 422 and CSD 532.

CSD 580. Interprofessional Health Care. 1 Credit.
The purpose of the course is to learn to work effectively in an interdisciplinary health care team, using a shared patient-centered approach. Students work with other team members from physical therapy, nursing, occupational therapy, medicine, social work, clinical lab science, and dietetics. Case studies using problem-based learning techniques are the primary teaching strategy. S/U grading.

CSD 583. Evaluation and Service Delivery. 3 Credits.
The study of: 1) the underlying principles and philosophies of evaluation in speech-language pathology, including interviewing, administering and interpreting diagnostic tests and protocols, and client counseling; and 2) the concepts and principles of service delivery including creative problem solving, decision making, collaboration, and management of services.

CSD 584. Advanced Clinical Practicum. 1-16 Credits.
Provision of clinical services to individuals with communication disorders under the supervision of an ASHA certified supervisor. Placement will be the UND Speech-Language-Hearing Clinic or a departmentally-approved external site. Prerequisites: CSD 485 and consent of instructor. Repeatable.

CSD 585. Practicum in the School Setting. 10 Credits.
Supervised practicum in a University-approved cooperating school. Prerequisites: Graduate standing and consent of department.

CSD 586. Advanced Clinical Practicum: Audiology. 1-16 Credits.
The administration and interpretation of tests and procedures for evaluation of human auditory functioning; practice involving interviews, case histories and client counseling.

CSD 592. Research Design in Speech and Hearing Sciences. 3 Credits.
The use of speech science instrumentation and data collection and analysis in human speech, language and hearing. Prerequisites: CSD 541 and 543.

CSD 595. Research Problems in Speech-Language Pathology-Audiology. 1-3 Credits.
A. Speech-Language Pathology. B. Audiology. Prerequisite: Consent of instructor. Repeatable.

CSD 597. Special Problems in Communication Disorders. 1-3 Credits.
An examination of special topics in communication disorders. Prerequisite: Consent of instructor. Repeatable.

CSD 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CSD 997. Independent Study. 2 Credits.

CSD 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

CSD 999. Dissertation. 1-12 Credits.
Repeatable to 18 credits.

Undergraduate Courses for Graduate Credit

CSD 343. Language Development. 3-4 Credits.
The nature and development of linguistic content, form, and use, from birth to adulthood are studied relative to the development of communication and speech; relative to cognitive, social, and physical development; and relative to cultural diversity. Prerequisites or Corequisites: ENGL 209, PSYC 241 and PSYC 250 and CSD 340; or equivalents. F.

CSD 431. Introduction to Audiology. 3 Credits.
Elementary structure and function of the hearing mechanism; basic psychophysical dimensions of the auditory mechanism; types of deficient hearing; pure tone threshold and screening audiometry. Students are required to do hearing testing to qualify for certification in speech and hearing. Prerequisites: CSD 231 and CSD 235, and MATH 103. F.

CSD 434. Aural Rehabilitation. 3 Credits.
Principles, techniques and clinical practice in the diagnosis and rehabilitation of hearing disorders in children and adults; auditory training, speech reading and hearing conservation. Prerequisites: CSD 431 and CSD 343, or consent of instructor. S.

CSD 497. Special Problems in Communication Disorders. 1-3 Credits.
An examination of special topics in Communication Disorders. Prerequisite: Consent of instructor. Repeatable. On demand.

Computer Science

http://www.cs.und.edu

FACULTY: Desell, Grant (Graduate Director), Hu, Kim, Liu, Marsh (Chair), O’Neil and Reza

Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Department of Computer Science offers graduate study leading to the Master of Science degree, thesis and non-thesis options, a combined degree, and the Doctor of Philosophy in Scientific Computing (emphasizing the development of software, the science and the technology required to support Computational Science). The department is a part of the John D. Odegard School of Aerospace Sciences, which provides unique opportunities for research by faculty and graduate students. There is strong interest within the department in the areas of artificial intelligence, computer security, database, image processing, internet applications, networks, object oriented design, operating systems, simulation, software engineering, and theoretical computer science.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Computer Science Department’s graduate program is to serve as a center for intellectual and educational development that promotes critical and logical thinking, and the mastery of a student focused Computer Science curriculum. The graduate program strives to give all students a solid
foundation in the core areas of computer science, to prepare students for research and study beyond the master’s level, and to prepare students for careers in computing and software development.

In support of this mission, a curriculum has been developed which encourages a formal, abstract, theoretical, and practical approach to the study of computer science, while providing students with experience on state-of-the-art equipment. A number of hardware and software computing platforms are available to students.

**Goal 1:** Students will acquire a broad knowledge of theoretical and applied topics in computer science and develop communication skills.

**Goal 2:** Students will develop creative thinking, problem solving and research skills, and acquire expertise in a specific computer science domain.

### Combined Degree Program (B.S./M.S.)

To encourage undergraduate computer science students to extend their studies to include a graduate degree, the Computer Science Department has a combined program which permits students to earn both B.S. and M.S. degrees in the discipline. This program allows students to designate two three-credit hour courses to count for both degrees. The two three-credit hour courses designated for both degrees must not have been completed at the time of application and they must have graduate course standing.

Students may be admitted to the Computer Science Combined Degree Program after completion of 90 credit hours towards the B.S. degree with a GPA of at least 3.0, and before completion of the B.S. degree.

Completed applications must be received at the School of Graduate Studies by May 15 for Fall semester admittance and August 15 for Spring semester admittance. A complete application includes:

1. School of Graduate Studies application and application fee
2. Three letters of reference
3. Statement of Purpose
4. Transcripts
5. Program of Study - Computer Science Combined Degree

The student is admitted to the School of Graduate Studies upon the completion of 125 credit hours toward the B.S. degree with a GPA of 3.0 and before completion of the B.S. degree. Students in the program may opt to be awarded their B.S. and M.S. degrees sequentially or at the same time.

### Scientific Computing Doctor of Philosophy (Ph.D.)

**Mission Statement and Program Goals**

The mission of the Computer Science Department’s graduate program is to serve as a center for intellectual and educational development that promotes critical and logical thinking, and the mastery of a student-focused Computer Science curriculum. The graduate program strives to prepare students to become lead or supporting researchers in any branch (bioinformatics, atmospheric science, software design, etc.) of Computational Science.

Given the breadth of disciplines served by scientific computing and the wide range of experience we expect students to bring to the program, the curriculum has been designed such that the student will gain invaluable “practice experience” by experiencing first-hand the needs of practitioners in that particular field. A number of hardware and software computing platforms are available to students.

**Goal 1:** Graduates will be prepared to become experts in the fields of Computational Science.

**Goal 2:** Graduates will be proficient in the use of high-performance computing platforms and computing techniques.

### Master of Science (M.S.)

#### Admission Requirements

1. Bachelor’s degree, normally in Computer Science.
2. Overall undergraduate GPA of at least 2.85.
3. Graduate Record Examination General Test or an undergraduate degree from a CSAB/ABET accredited degree program in Computer Science.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. International applicants who have received their bachelor’s or master’s degree in the United States or English-speaking Canada are not required to submit the TOEFL or IELTS.

Applicants with a background in mathematics, science or engineering will also be considered if they are adequately prepared in the field of computer science.

Students who do not meet all of these prerequisites may be admitted in Qualified or Provisional status with the obligation of meeting the remaining requirements early in their graduate study.

#### Degree Requirements

Students seeking the Master of Science degree must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Computer Science Department.

**Required Core Courses - 12 credits (2 courses from each group):**

<table>
<thead>
<tr>
<th>Group</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CSCI 522</td>
<td>Theoretical Foundations of Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>CSCI 532</td>
<td>High Performance Computing and Paradigms</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>CSCI 565</td>
<td>Advanced Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>CSCI 575</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>CSCI 513</td>
<td>Advanced Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>CSCI 543</td>
<td>Advanced Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>CSCI 551</td>
<td>Distributed Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>CSCI 555</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

**Non-Thesis Option (32 credit hours):**

1. The core of required courses (12 credits).
2. Six elective courses (18 credits). CSCI 500 Graduate Orientation and CSCI 566 Software Engineering Project may not be used as electives. Only three credits of CSCI 591 Directed Studies may be used as an elective.
3. CSCI 997 Independent Study, in a format suitable for publication (2 credits).
4. Successful completion of a written comprehensive examination in the four areas.
5. Preparation of an oral presentation of the study (CSCI 997 Independent Study) to the advisor, Graduate Program Committee, and interested faculty and students.

**Thesis Option (30 credit hours):**

1. The core of required courses (12 credits).
2. Four elective courses (12 credits). CSCI 500 Graduate Orientation and CSCI 566 Software Engineering Project may not be used as electives. Only three credits of CSCI 591 Directed Studies may be used as an elective.
3. Thesis (6 credits).
4. Successful completion of a written comprehensive examination in the four areas.
5. A final oral examination, which includes a defense of the thesis to the Faculty Advisory Committee, and intersted faculty and students.
Scientific Computing Doctor of Philosophy (PhD.)

Admission Requirements

1. Master’s degree, normally in an engineering or science related field with an overall graduate GPA of at least 3.25 (on a 4.0 scale), or a Bachelor’s degree, normally in an engineering or science related field with an overall undergraduate GPA of at least 3.00 (on a 4.0 scale) and the Graduate Record Examination General Test.

2. Prerequisites:
   - Expertise in a high level language and a basic knowledge of data structures.
   - Basic knowledge of formal languages, automata, and computability.
   - Basic knowledge of computer architecture or operating systems.
   - Basic knowledge of calculus, statistics, and linear algebra.

3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section.

The department recognizes that the prerequisite expertise identified above may be acquired in several ways. Students who do not meet all of the requirements may be admitted to qualified status with the obligation of meeting the remaining requirements early in their graduate study.

Degree Requirements

Students seeking the Doctor of Philosophy in Scientific Computing degree must satisfy all general requirements set forth by the School of Graduate Studies. In addition, they must meet the following requirements set by the Computer Science Department:

1. All students are required to obtain interdisciplinary graduate training. This requirement may be met by:
   a. Either taking two course clusters from the computational category and one course cluster from an applications category
   b. Or taking three course clusters from the computational category and conducting dissertation research in an applications category in the applicable department.

2. Course clusters must be approved by the student’s Faculty Advisory Committee.

3. Students may, with approval of the Computer Science Department’s Graduate Committee, design their own applications category cluster.

4. The student’s Faculty Advisory Committee must include one member from the applicable applications cluster or dissertation research.

5. The Computer Science Department's Graduate Committee must approve the Faculty Advisory Committee membership.

6. Students who have a degree in a field other than Computer Science are not required to obtain interdisciplinary graduate training. These students are required to take three computational category course clusters. In addition, the student’s Faculty Advisory Committee will comprise only from Computer Science faculty.

7. Students with approved Bachelor degree:
   a. Must complete 51-66 credit hours of coursework;
   b. Must complete eight of the core courses.

8. Students with approved Master degree:
   a. Must complete 27-39 credit hours of coursework;
   b. Must complete four of the core courses.

9. Elective courses: CSci 500 and CSci 566 may not be used as electives. Only 3 credits of CSci 591 may be used as an elective.

10. Successful completion of written Graduate Qualifying Examination (GQE). The GQE’s passing cut off point will be higher than the GQE’s passing for Master Students (MS) taking the same exam. The GQE will consist of questions on each of the four areas. Moreover, the PhD students are required to complete GQE’s requirement within the first 4 semesters, but are strongly encouraged to complete the GQE earlier in their studies.

11. Successful completion of Graduate Comprehensive Exam (GCE).


13. Completion of CSci 999 Dissertation (12 credits maximum).

14. Final oral examination, which includes a defense of the dissertation.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 599</td>
<td>Research</td>
<td>1-21</td>
</tr>
<tr>
<td>CSCI 999</td>
<td>Dissertation</td>
<td>1-12</td>
</tr>
</tbody>
</table>

Core courses:

- CSCI 513 Advanced Database Systems 3
- CSCI 522 Theoretical Foundations of Computer Science 3
- CSCI 532 High Performance Computing and Paradigms 3
- CSCI 543 Advanced Artificial Intelligence 3
- CSCI 551 Distributed Operating Systems 3
- CSCI 555 Computer Networks 3
- CSCI 565 Advanced Software Engineering 3
- CSCI 575 Analysis of Algorithms 3

Core Clusters:

Computational Clusters:

The computing clusters contain related courses that provide depth of knowledge in specialized computing systems or methods.

1. Software Engineering Cluster: Software engineering combines the ideas from engineering, management, and math disciplines in order to improve our ability to build complex software systems on time and within the budget. Requires any three of the following courses:
   - CSCI 463 Software Engineering 3
   - CSCI 562 Formal Specification Methods 3
   - CSCI 565 Advanced Software Engineering 3
   - CSCI 582 Software Architecture 3

2. Data Management Cluster: The cluster enhances a student’s knowledge in data engineering and management. It includes the study of database systems, data management, data mining and data warehousing, digital libraries and information retrieval and systems. Requires the following three courses:
   - CSCI 455 Database Management Systems 3
   - CSCI 513 Advanced Database Systems 3
   - CSCI 515 Data Engineering and Management 3

3. Artificial/Computational Intelligence Cluster: The goal of this track is to provide the student with both classical and advanced topics in artificial and computational intelligence. It includes the study of problem solving methods, approximate reasoning, machine learning, decision making, data mining and other application techniques. Requires the following three courses:
   - CSCI 543 Advanced Artificial Intelligence 3
   - CSCI 544 Soft Computing 3
   - CSCI 554 Applications in AI/Computational Intelligence 3

4. Distributed Systems Cluster: The goal for this track is to provide the student with an understanding of the hardware technologies (hardware, network, and storage devices) required to develop a machine suitable for high performance computing. Requires the following three courses:
   - CSCI 427 Advanced Data Communications 3
### Application Clusters

The application clusters provide exposure to specific scientific disciplines that commonly make use of scientific computing methods. In addition to the clusters listed here, other clusters may be defined by the Faculty Advisory Committee with approval of the Computer Science Department’s Graduate Committee.

1. **Computational Mathematics Cluster**: This cluster provides an understanding of the computational methods used to solve complex mathematical problems on a digital computer. Requires three graduate level mathematics courses. Possible courses are:
   - **MATH 461** Numerical Analysis

2. **Computational Chemistry Cluster**: This cluster provides an understanding of the mathematical tools used to solve several major classes of problems in modern theoretical chemistry on a digital computer. Requires three graduate level chemistry courses. Possible courses include:
   - **CHEM 470** Thermodynamics & Kinetics
   - **CHEM 471** Quantum Mechanics & Spectroscopy
   - **CHEM 530** Chemical Thermodynamics
   - **CHEM 534** Chemical Thermodynamics

3. **Computational Physics Cluster**: This cluster provides an understanding of the mathematical tools used to solve current problems in modern physics on a digital computer. Requires the following courses:
   - **PHYS 402** Computers in Physics
   - **PHYS 509** Methods of Theoretical Physics
   - **PHYS 460** Introduction to Astrophysics
   - **PHYS 461** Introduction to Astrophysics II
   - **PHYS 510** Methods of Theoretical Physics
   - **PHYS 535** Solid State Physics
   - **PHYS 536** Solid State Physics II
   - **PHYS 539** Quantum Mechanics
   - **PHYS 540** Quantum Mechanics
   - **PHYS 541** Theory Electricity Magnetism
   - **PHYS 542** Theory of Electricity and Magnetism
   - **PHYS 543** Statistical Physics
   - **PHYS 545** Analytical Mechanics

4. **Atmospheric Sciences Cluster**: This cluster provides an understanding of the mathematical tools used to solve several major classes of problems in modern atmospheric sciences on a digital computer. Requires the following courses:
   - **ATSC 505** Advanced Atmospheric Dynamics
   - **ATSC 530** Numerical Weather Prediction
   - Select one of the following:
     - **ATSC 528** Atmospheric Data Analysis
     - **ATSC 535** Measurement Systems
     - **ATSC 540** Statistical Methods in Atmospheric Science
     - **ATSC 555** Advanced Surface Transportation Weather

### Courses

- **CSCI 500. Graduate Orientation. 1 Credit.**
  A discussion of various research and applied computing projects. Continued enrollment required of all graduate students until a research/project topic and an advisor are selected. S/U grading.

- **CSCI 501. Topics in Computer Science. 1-3 Credits.**
  Selected topics from current developments in Computer Science. Repeatable to 3 credits. Prerequisite: Permission of department. Repeatable to 3 credits.

- **CSCI 513. Advanced Database Systems. 3 Credits.**
  A study of concurrency control, recovery, query processing and optimization, security, and new advancements including research issues in database systems. Prerequisite: CSCI 455.

- **CSCI 515. Data Engineering and Management. 3 Credits.**
  This course studies theoretical and applied research issues related to data engineering and management. Topics will reflect state-of-the-art and state-of-the-practice activities in the field. The course focuses on well-defined theoretical results and empirical studies that have potential impact on the acquisition, management, storage, and graceful degeneration of data, as well as in provision of data services. Prerequisite: CSCI 513.

- **CSCI 522. Theoretical Foundations of Computer Science. 3 Credits.**
  A selection of topics from theoretical computer science, possibly including formal languages, automata, other models of computation, and the theory of computability, decidability, and complexity. Prerequisite: CSCI 435.

- **CSCI 523. High Performance Computing and Paradigms. 3 Credits.**
  A study of current topics in threads, inter-process communication and synchronization, master-slave and peer designs for concurrency, client-server architectures, cluster/grid computing and massively parallel computer architectures. A considerable amount of programming will be done in one or more of these environments. F, even years.

- **CSCI 537. Graduate Cooperative Education. 1-2 Credits.**
  A practical work experience in advanced computing, approved by the student's advisor. Requirements include a written report and an oral presentation upon completion of the work experience. Prerequisites: A minimum of 9 graduate credits in computer science and consent of the Department. S/U grading. On demand.

- **CSCI 543. Advanced Artificial Intelligence. 3 Credits.**
  Study and application of advanced and recent topics drawn from two or more areas of Artificial Intelligence: problem solving, knowledge representation, expert system, approximate reasoning, planning, machine learning, natural language processing and perception. Prerequisite: CSCI 365 or CSCI 384.

- **CSCI 554. Soft Computing. 3 Credits.**
  A study of the new computational paradigm and its techniques called Soft Computing, which stands between the pure/hard mathematical computing and a classical symbolic AI computing. The topic includes Fuzzy Logic, Neural Network, Evolutionary Algorithm, and/or Support Vector Machine. Prerequisite: Consent of instructor. S, even years.

- **CSCI 555. Discrete Dynamical Systems Modeling and Simulation. 3 Credits.**
  A study of various modeling methods applicable to large scale distributed and parallel systems. Topics include cellular automata, grid models, and chaos theory. Prerequisite: CSCI 445.
CSCI 546. Advanced Computer Graphics. 3 Credits.
An introduction to advanced topics in computer graphics. Included are light and color theory, image processing and compression, spatial-frequency transforms, raytracing, sampling theory, and topics of current interest. Prerequisites: CSCI 466 and MATH 265. S, even years.

CSCI 547. Scientific Visualization. 3 Credits.
This course will conduct a detailed study of visualization techniques useful in the analysis of engineering and scientific data. Topics include the study of physical models; methods of computational science; two- and three-dimensional data types; visual representation schemes for scalar, vector, and tensor data; isosurface and volume visualization methods; visual monitoring and interactive steering. Prerequisites: CSCI 466 and CSCI 546. On demand.

CSCI 551. Distributed Operating Systems. 3 Credits.
A study of operating systems in the context of distributed systems and distributed processing. Topics include: interprocess communication, process synchronization, distributed file systems and memory management, performance measurement and evaluation. A modern distributed processing system will be examined. Prerequisites: CSCI 370, CSCI 451; and one of the following: CSCI 327, CSCI 427 or CSCI 555.

CSCI 554. Applications in AI/Computational Intelligence. 3 Credits.
A continuous study of the computational paradigms of Soft Computing in the field of Computational Intelligence. The topics include the applications of various soft computing techniques in Computational Intelligence as well as more evolutionary algorithms in Swarm Intelligence. Prerequisite: CSCI 544, F, even years.

CSCI 555. Computer Networks. 3 Credits.
A study of new and developing network architectures and communication protocols. Broadband technologies will be considered including BISDN, ATM networks, and other high-speed networks. Prerequisite: CSCI 327.

CSCI 562. Formal Specification Methods. 3 Credits.
A foundational course that introduces several formal specification techniques for construction and analysis of software artifacts. Included are rigorous program development, abstract specifications of modules, and modeling of concurrent and distributed software. Prerequisites: CSCI 435 and CSCI 463.

CSCI 565. Advanced Software Engineering. 3 Credits.
A study of current topics related to the design and implementation of large software systems. Course content may vary with instructor and student interest. Potential topics include: software testing and validation, programming environments, program metrics and complexity, design methodologies, software reliability and fault tolerance. Prerequisite: CSCI 463.

CSCI 566. Software Engineering Project. 3-6 Credits.
The complete development of a useful software product, including specifications, design, documentation, coding, testing and verification. Students may work in teams. The project is supervised by the students' Independent Study Advisor. This course may not be used as an elective for the thesis option in computer science. Repeatable to 6 credits. Prerequisite: CSCI 463. Repeatable to 6 credits.

CSCI 575. Analysis of Algorithms. 3 Credits.
The time and space complexity of classical computer algorithms is analyzed. NP hard and NP complete problems are characterized and illustrated. Prerequisite: CSCI 435.

CSCI 582. Software Architecture. 3 Credits.
Software architecture is a fairly young sub-discipline within software engineering; it is aimed at shifting the designer's focus from algorithmic control structure to interactive interrelations among components. This course, among other things, will expose students to the concepts of design, design of design, principles and state-of-the-art methods and techniques in software architectures, which include the discussion of architectural patterns (or styles), domain specific architectural design, formal architectural description languages (ADLs), software connectors (simple and composite), architectural analysis, and middleware and component-based software development. Prerequisites: CSCI 463 and CSCI 435.

CSCI 588. Data Structure, Algorithms, and Software Design in C++. 3 Credits.
This course is intended for the Scientific Computing Ph.D students. The course attempts to introduce C++ via laboratory sessions. More specifically, this course tries to incorporate Data Structures and Algorithms in C++ as well as Software Design in C++. During these sessions the students are introduced to C++ concepts using a series of examples. Having examined the examples given in the session and having understood the concepts covered, the student should be able to complete open-ended problems. This course assumes no prior knowledge of C++.

CSCI 591. Directed Studies. 1-3 Credits.
An investigation of some specific area by an individual or small group of students working closely with a member of the graduate faculty. 1-3 credits in each graduate degree program. Prerequisites: Graduate standing and consent of instructor. Repeatable to 6 credits. F,S,SS.

CSCI 599. Research. 1-6 Credits.
This course is intended for Ph.D students to obtain credit for their research efforts. Repeatable to 21 credits. Repeatable to 21 credits. S/U grading.


CSCI 997. Independent Study. 2 Credits.

CSCI 998. Thesis. 1-9 Credits. Repeatable to 9 credits.

CSCI 999. Dissertation. 1-12 Credits. Repeatable to 12 credits. F,S,SS.

Undergraduate Courses for Graduate Credit

CSCI 427. Advanced Data Communications. 3 Credits.
Analysis of existing and future data communications technologies and protocols, including the modeling of realistic networked environments and the analysis of their performance. Prerequisites: CSCI 327. S, even years.

CSCI 435. Formal Languages and Automata. 3 Credits.
A study of automata, grammars, and Turing machines as specifications for formal languages. Computation is defined in terms of deciding properties of formal languages, and the fundamental results of computability and decidability are derived. Prerequisites: CSCI 242 and minimum second semester junior standing. F.

CSCI 445. Mathematical Modeling and Simulation. 3 Credits.
A study of various mathematical applications for digital computers, including the modeling, simulation and interpretation of the solution of complex systems. Prerequisites: CSCI 161 or CSCI 170, and MATH 166 and a statistics course. F, even years.

CSCI 446. Computer Graphics I. 3 Credits.
Introduction to computer graphics. Topics include display technology, light and color, 2D and 3D representations, image processing, ray-tracing, and computer animation. Prerequisites: CSCI 242, CSCI 363, and MATH 166. F, odd years.

CSCI 448. Computer Graphics II. 3 Credits.
A continuation of CSCI 446, topics covered include: history of games, game taxonomies, game design theory, computer game development, physics engines and AI engines. Prerequisite: CSCI 446. S, even years.

CSCI 451. Operating Systems I. 3 Credits.
Introduction to operating system theory and fundamentals. Topics include: multiprogramming, CPU scheduling, memory management methods, file systems, interprocess communication, and a survey of modern operating systems. Prerequisites: CSCI 242 and CSCI 370. F.

CSCI 452. Operating Systems II. 3 Credits.
A study of the implementation of operating systems and parts of operating systems, and development of system software. Prerequisites: CSCI 451. On demand.

CSCI 455. Database Management Systems. 3 Credits.
Database concepts, database administration, database design, and database performance, including the partial design of a DBMS application. Prerequisite: CSCI 242. S.
CSCI 457. Electronic Commerce Systems. 3 Credits.
A study of electronic commerce system architecture and electronic commerce content design and implementation. Topics include Internet basics, business issues, Web markup languages, static and dynamic Web programming, e-commerce content design and construction, and databases and host languages with embedded SQL such as JDBC. Prerequisite: CSCI 260. S, odd years.

CSCI 463. Software Engineering. 3 Credits.
This course teaches software engineering principles and techniques used in the specification, design, implementation, verification and maintenance of large-scale software systems. Major software development methodologies are reviewed. As development team members, students participate in a group project involving the production or revision of a complex software product. Prerequisites: CSCI 242 and CSCI 363. S.

CSCI 465. Principles of Translation. 3 Credits.
Techniques for automatic translation of high-level languages to executable code. Prerequisites: CSCI 365 and CSCI 370. F, odd years.

CSCI 491. Seminars in Computer Science. 1 Credit.
A course for advanced students. Repeatable to 3 credits. Prerequisite: Consent of instructor. Repeatable to 3 credits. S/U grading. F.S.

Counseling Psychology and Community Services

http://education.und.edu/counseling-psychology-and-community-services/index.cfm

FACULTY: Arbaugh (Distance MA Co-Director), Edwards (Master’s Director), Hutchison (Ph.D. Training Co-Director), Juntunen, Navarro (Chair, Distance MA Co-Director), Perry (RHS Director), Tillman, Walton, and Wettersten (Ph.D. Training Co-Director)

Degrees Granted: Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.)

The Department of Counseling Psychology and Community Services offers graduate programs leading to the Master of Arts in Counseling and Doctor of Philosophy in Counseling Psychology. The Doctor of Philosophy in Counseling Psychology is accredited by the American Psychological Association (APA). Completion of the M.A. program partially fulfills requirements for certification as a School Counselor, certification as a Certified Rehabilitation Counselor, licensure as an Addictions Counselor, or licensure as a Licensed Associate Professional Counselor and ultimately a Licensed Professional Counselor in North Dakota, as well as potentially in other states (depending on the state’s specific requirements). The Ph.D. in Counseling Psychology provides preparation for licensure as a Psychologist in North Dakota, as well as other states.

To encourage students who are majoring in Rehabilitation and Human Services to extend their studies to include a graduate degree, the Department offers a Combined Program in Counseling with a Rehabilitation Emphasis. The Combined Program allows students to earn a bachelor’s degree in Rehabilitation and Human Services and a master’s degree in Counseling with a Rehabilitation Emphasis in approximately five years. This would be a year less than is typically required to complete these degrees separately.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Arts (M.A.)

Mission Statement
The Master of Arts is appropriate for those who wish to become counselors in K-12 schools or community agencies, such as addiction treatment clinics, mental health centers, rehabilitation agencies, and family service organizations. A commitment to social justice and appreciation of diversity are integrated throughout the curriculum. The Department of Counseling Psychology and Community Services is also committed to seeking and valuing diversity in students and staff. This includes the variety of cultures, backgrounds, values, and experiences found among faculty and students; it also includes the diversity of our professional ways of practice, our ways of learning, and our personal and professional goals. We are committed to training multiculturally competent counselors. On-campus students are admitted to one of three program emphases: Addiction Counseling, Community Mental Health Counseling, or Rehabilitation Counseling. An emphasis in School Counseling is available only through our synchronous distance program. Each program emphasis has separate requirements.

Program Goals
Students are expected to:
1. demonstrate critical thinking skills through written assignments and oral presentations;
2. articulate an awareness of the needs of diverse populations and develop sensitivity and skills to meet these needs;
3. demonstrate counseling skills such as empathic listening, clarification, cognitive reframing, confrontation, and crisis intervention;
4. demonstrate the ability to reflect upon one’s values, beliefs, skills, and interventions, particularly in the context of a clinical supervisory relationship in which accepting and responding positively to feedback are expected;
5. conduct an independent research project, analyze the findings, and report the results in a scholarly manner;
6. develop ethical decision-making skills demonstrated across a broad spectrum of professional functioning areas, and
7. acquire knowledge in eight areas of competency.

The eight competencies are:
1. Human Growth and Development;
2. Social and Cultural Foundations;
3. Helping Relationships;
4. Group Work;
5. Career and Lifestyle Development;
6. Appraisal;
7. Research and Program Evaluation; and
8. Professional Orientation & Ethics.

Counseling Psychology Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals
The program provides preparation at the Ph.D. level for employment in a variety of academic and psychological service settings, such as: community mental health agencies, college and university counseling centers, hospitals and medical centers, college and university departments of counseling and psychology, or independent private practice. The program provides preparation for licensure as a psychologist and is accredited by the American Psychological Association. The curriculum adheres to recommendations of the American Psychological Association for the preparation of counseling psychologists and reflects a model which equally emphasizes science and practice.

The program accepts students at the post bachelor’s and post master’s level. The Department is committed to diversity, particularly to training for Native Americans and those from other underrepresented groups, and emphasizes the role of social justice across all psychological practice. The program offers unique training in Rural Psychology in Integrated Care Settings.

The overarching goal of the Ph.D. program in Counseling Psychology is to prepare entry-level counseling psychologists who are well-trained and competent in both the practice and science of the profession. Within that overarching goal, the program has developed a set of six specific training goals:
1. To prepare entry-level counseling psychologists who demonstrate attitudes and behaviors related to foundational professionalism.
2. To prepare entry-level counseling psychologists who have a knowledge base in the biological, social, cognitive/affective and individual differences foundations of psychology.
3. To prepare entry-level counseling psychologists who have strong and coherent professional identities.
4. To prepare entry-level counseling psychologists who demonstrate competency in their use of clinical skills.
5. To prepare entry-level counseling psychologists who possess sound research skills.
6. To prepare entry-level counseling psychologists who possess effective teaching skills.

In addition to the six required training goals, each student must develop a level of proficiency in one additional area of competency, to be selected from Consultation, Leadership, Child & Adolescent Psychotherapy, or Grant-Writing.

**Master of Arts (M.A.)**

**Admission Requirements**

**On-Campus M.A. Emphasis**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university (or be in a combined program).
2. Twenty semester credits of coursework in the behavioral sciences at the undergraduate level, which must include theories of personality, abnormal psychology, developmental psychology, and statistics. Additional courses in psychology and sociology may be applied toward this prerequisite. Courses in other social science disciplines where the focus is on the description or explanation of individual or group behavior may be accepted in fulfillment of this prerequisite at the discretion of the department.

Applicants must submit this information on the “Supplemental Application Form and Undergraduate Coursework Summary.”

3. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
4. Satisfactory performance on the Graduate Record Exam General Test or the Miller Analogies Test.
5. Favorable recommendations and the admission committee’s perception of the “best fit” based on the applicant’s personal statement.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**On-Campus M.A. Degree Requirements**

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Counseling Psychology and Community Services Department.

**Thesis Option:**

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credits required for the degree may be transferred from another institution.
4. Required Core and Emphasis courses.

**Non-Thesis Option:**

1. Thirty-two (32) credits including credits required for the major.
2. A minimum of two credits of Independent Study.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.
6. Comprehensive final examination.
7. Required Core and Emphasis courses.

**Required Core Courses:**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COUN 502</td>
<td>Professional Issues in Counseling</td>
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<tr>
<td>COUN 503</td>
<td>Professional Issues: Internship and Job Preparation</td>
<td>1</td>
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<tr>
<td>COUN 507</td>
<td>Life-Span Development in Counseling</td>
<td>3</td>
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<tr>
<td>COUN 510</td>
<td>Counseling Methods</td>
<td>3</td>
</tr>
<tr>
<td>COUN 515</td>
<td>Methods of Research</td>
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<tr>
<td>COUN 516</td>
<td>Counseling Research Laboratory</td>
<td>1</td>
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<tr>
<td>COUN 518</td>
<td>Group Theory and Process</td>
<td>3</td>
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<tr>
<td>COUN 519</td>
<td>Career Counseling</td>
<td>3</td>
</tr>
<tr>
<td>COUN 520</td>
<td>Diagnostic and Prevention Strategies in Counseling</td>
<td>3</td>
</tr>
<tr>
<td>COUN 529</td>
<td>Dynamics of Addiction</td>
<td>3</td>
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<tr>
<td>COUN 530</td>
<td>Theories of Counseling, Personality and Development</td>
<td>3</td>
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<td>COUN 531</td>
<td>Psychology of Women, Gender and Development</td>
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<td>COUN 532</td>
<td>Multicultural Counseling</td>
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<td>COUN 533</td>
<td>Couples And Family Counseling</td>
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<td>COUN 580</td>
<td>Counseling Practicum</td>
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<td>COUN 585</td>
<td>Counseling Psychology Research Practicum</td>
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<tr>
<td>COUN 590</td>
<td>Professional Seminars</td>
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</tr>
<tr>
<td>COUN 595</td>
<td>Scholarly Project</td>
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</table>

**Total Credits**

40

**Plus One of the Following Emphasis Areas:**

**Addiction Counseling Emphasis**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>COUN 501</td>
<td>Ethics: Counseling and Counseling Psychology</td>
<td>3</td>
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<tr>
<td>COUN 517</td>
<td>Psychological Testing</td>
<td>3</td>
</tr>
<tr>
<td>COUN 587</td>
<td>Addictions Counseling Internship (2 semesters; 8-12 credits/semester)</td>
<td>8-12</td>
</tr>
<tr>
<td>COUN 995</td>
<td>Scholarly Project</td>
<td>2-4</td>
</tr>
<tr>
<td>or COUN 997</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>or COUN 998</td>
<td>Thesis</td>
<td></td>
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<tr>
<td>Electives</td>
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<tr>
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<tbody>
<tr>
<td>COUN 505</td>
<td>History of Psychology</td>
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<tr>
<td>COUN 560</td>
<td>Supervision Theory and Technique</td>
<td></td>
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<tr>
<td>COUN 561</td>
<td>Consultation Theory and Practice</td>
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<tr>
<td>COUN 562</td>
<td>Consultation Laboratory</td>
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<tr>
<td>COUN 565</td>
<td>Professional Seminars</td>
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<tr>
<td>COUN 585</td>
<td>Counseling Psychology Research Practicum</td>
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**Community Mental Health Counseling Emphasis**

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<td>COUN 501</td>
<td>Ethics: Counseling and Counseling Psychology</td>
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<tr>
<td>COUN 517</td>
<td>Psychological Testing</td>
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<tr>
<td>COUN 584</td>
<td>Community Counseling Internship (2 semesters; 8 credits/semester)</td>
<td>8</td>
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<td>COUN 995</td>
<td>Scholarly Project</td>
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<tr>
<td>or COUN 997</td>
<td>Independent Study</td>
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<td>Thesis</td>
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<tr>
<td>COUN 565</td>
<td>Professional Seminars</td>
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<td>COUN 585</td>
<td>Counseling Psychology Research Practicum</td>
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<td>Electives</td>
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**Rehabilitation Counseling Emphasis**

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<th>Course Title</th>
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<tr>
<td>COUN 506</td>
<td>Rehabilitation Counseling: Foundations and Ethical Issues</td>
<td>3</td>
</tr>
<tr>
<td>COUN 514</td>
<td>Rehabilitation Counseling: Assessment and Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>COUN 588</td>
<td>Rehabilitation Counseling Internship (2 semesters; 8 credits/semester)</td>
<td>8</td>
</tr>
<tr>
<td>COUN 995</td>
<td>Scholarly Project</td>
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<td>or COUN 997</td>
<td>Independent Study</td>
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<td>COUN 585</td>
<td>Counseling Psychology Research Practicum</td>
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**Total Credits**

40
After successfully completing practicum, students will enroll in an Internship in COUN 584 Community Counseling Internship, COUN 587 Addictions Counseling Internship or COUN 588 Rehabilitation Counseling Internship, depending on program emphasis, which is a two-semester supervised counseling experience at an external site. Internship will typically be completed during the second year in the program for full-time students. Internship assignments are individually arranged and administered by the department’s Internship Coordinator.

In addition to this practitioner course sequence, students are required to complete a series of research training experiences, culminating in the completion of COUN 997 Independent Study or COUN 995 Scholarly Project an independent research project conducted under the direction of the student’s advisor. Students are encouraged to begin considering and planning their research project early in their program.

After completing the majority of coursework for the degree and advancing to candidacy, students are eligible to sit for the Master’s Comprehensive Examination, which is offered once each fall and spring semester. A passing score on the examination is required for graduation.

School Counseling Emphasis - Distance

A Master of Arts in Counseling, with a school counseling emphasis is offered via an synchronous distance program. The School Counseling emphasis prepares students to promote the academic, career, personal, and social development of K-12 students. Completion of coursework prepares students for licensure from the North Dakota Educational Standards and Practices Board as a school counselor, and is compatible with licensure requirements in other states.

Through online courses, practical experiences, and two extended-weekend, on-campus visits for two consecutive summers, students are prepared to practice as professional school counselors in elementary schools, middle schools, and high schools. Students receive a broad, theoretical foundation in counseling, plus hands-on experiences. A commitment to social justice and appreciation of diversity is also integrated throughout the curriculum.

Distance M.A. Degree Admission Requirements

Prerequisites:

- Twenty semester credits of undergraduate coursework in the behavioral sciences at the undergraduate level, which must include educational psychology, educational instruction methods, classroom management, and statistics. Coursework in other social sciences disciplines where the focus is on the education, description or explanation of individual or group behavior may be accepted in fulfillment of this prerequisite at the discretion of the Counseling Psychology and Community Services Department.
- Admission is based on achievement in undergraduate work, favorable letters of recommendation and the admission committee’s perception of the “best fit” based on the applicant’s personal statement. Applicants must complete the “Supplemental Application Form and Undergraduate Coursework Summary.”

Distance M.A. Degree Requirements

- Students may enroll in the school counseling practicum after they have satisfactorily completed at least ten credits in the program. After successfully completing practicum, students will enroll in Internship in School Counseling which is a two-semester (4-6 credit) supervised counseling experience at elementary and secondary school sites. Students with a current educator license will complete 4 credit (400 hours) internships while students without educational backgrounds will be required to complete a 6 credit (600 hour) internship. Internship will typically be completed during the final semesters of the program. Internship placements are individually arranged in collaboration with the School Counseling Coordinator.
- In addition to the professional school counseling course sequence, students are required to complete a series of research training experiences, culminating in the completion of an independent research project conducted under the direction of the student’s adviser. Students are encouraged to begin considering and planning their research project early in their program.

After completing the majority of coursework for the degree and advancing to candidacy, students are eligible to sit for the Master’s Comprehensive Examination, which is offered spring semester. A passing score on the examination is required for graduation.

Courses

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<td>COUN 515</td>
<td>Methods of Research</td>
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<td>COUN 516</td>
<td>Counseling Research Laboratory</td>
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<td>COUN 517</td>
<td>Psychological Testing</td>
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<td>COUN 518</td>
<td>Group Theory and Process</td>
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<td>COUN 519</td>
<td>Career Counseling</td>
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<td>COUN 520</td>
<td>Diagnostic and Prevention Strategies in Counseling</td>
<td>3</td>
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<td>COUN 522</td>
<td>Management of School Counseling Programs</td>
<td>2</td>
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<td>COUN 523</td>
<td>Elementary School Counseling</td>
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<td>COUN 524</td>
<td>Middle School Counseling</td>
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<td>COUN 525</td>
<td>Secondary School Counseling</td>
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<td>COUN 526</td>
<td>Educational Collaboration</td>
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<td>COUN 527</td>
<td>School-Based Family Counseling</td>
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<td>COUN 530</td>
<td>Theories of Counseling, Personality and Development</td>
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<td>COUN 532</td>
<td>Multicultural Counseling</td>
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<td>COUN 581</td>
<td>School Counseling Practicum</td>
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<tr>
<td>COUN 589</td>
<td>School Counseling Internship (2-3 CR, 6-8 total)</td>
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<tr>
<td>COUN 995</td>
<td>Scholarly Project</td>
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<tr>
<td>or COUN 997</td>
<td>Independent Study</td>
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</table>

Total Credits

- With educator license: 48
- Without educator license: 50

Combined Program in Counseling with a Rehabilitation Emphasis

Bachelor of Science in Rehabilitation and Human Services/Master of Arts in Counseling Admission Requirements

The deadline for a completed application to be received in the School of Graduate Studies is February 1. In addition to the admission requirements for the Counseling Master’s program, a completed application must include the following:

1. At least 95 credit hours (including credits in progress) towards the bachelor’s degree in Rehabilitation and Human Services, including
   - RHS 200 Helping Skills in Community Services 3
   - RHS 250 Contemporary Issues in Rehabilitation 3
   - RHS 350 Overview of Disabilities 3
   - Parts IV and V in the RHS curriculum

2. Minimum GPA of 3.0 in all undergraduate work.
3. Written statement of interest in Rehabilitation Counseling as a profession.

Students are granted approved admission status in the School of Graduate Studies when they have completed a total of 125 undergraduate credits with an overall GPA of 3.0 or higher. This program allows students to designate two three-credit graduate courses to count for both degrees. These courses would be COUN 514 Rehabilitation Counseling: Assessment and Evaluation and COUN 519 Career Counseling.
The B.S. degree in Rehabilitation and Human Services and the M.A. degree in Counseling are granted at the same time. In the event that a student does not complete the graduate degree, the undergraduate degree is granted only after the completion of 125 credits, including an approved rehabilitation internship.

Degree Requirements

1. Completion of an additional 24 undergraduate credits during or after the senior year.
2. Completion of at least 60 credits of graduate course work, including:
   - COUN 502 Professional Issues in Counseling 1
   - COUN 503 Professional Issues: Internship and Job Preparation 1
   - COUN 506 Rehabilitation Counseling: Foundations and Ethical Issues 3
   - COUN 507 Life-Span Development in Counseling 3
   - COUN 510 Counseling Methods 3
   - COUN 514 Rehabilitation Counseling: Assessment and Evaluation 3
   - COUN 515 Methods of Research 3
   - COUN 516 Counseling Research Laboratory 1
   - COUN 518 Group Theory and Process 3
   - COUN 519 Career Counseling 3
   - COUN 520 Diagnostic and Prevention Strategies in Counseling 3
   - COUN 529 Dynamics of Addiction 3
   - COUN 530 Theories of Counseling, Personality and Development 3
   - COUN 531 Psychology of Women, Gender and Development 3
   - COUN 532 Multicultural Counseling 3
   - COUN 533 Couples And Family Counseling 3
   - COUN 580 Counseling Practicum 4

3. Completion of 8 credits of COUN 588 Rehabilitation Counseling Internship.
4. Completion of COUN 995 Scholarly Project (2cr.), COUN 997 Independent Study (2 cr.) or COUN 998 Thesis (4 cr.).

Counseling Psychology Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Keep grade of B or higher in at least four graduate level counseling courses or equivalent, including Counseling Methods, Theories and Techniques of Counseling, Counseling Practicum and Research Methods (for post-Master’s applicants).
2. Overall GPA of 3.0
3. Eighteen (18) semester credits of undergraduate psychology including coursework in general psychology, developmental psychology, abnormal psychology, personality theory, experimental and research methods, and statistics.
4. Graduate Record Examination—General Test, verbal, quantitative and writing.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Students are selected on the basis of undergraduate GPA, master’s degree GPA (if applicable), evaluations of pre-practicum and practicum performance when appropriate to the master’s degree program, scores on the verbal, quantitative and writing subtests of the Graduate Record Examination, references, vocational training and experiences, career goals, and perceived “best fit” by the admissions committee based on the applicant’s personal statement and the research and clinical interests of the faculty. Doctoral graduates from a recent three-year period have had the following average grades and scores: undergraduate GPA 3.44, master’s GPA 3.88, GRE-V 538, GRE-Q 603 and GRE-W 4.97. A balance between numbers of male and female students is preferred in the program. Students from minority ethnic groups are strongly encouraged to apply.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Counseling Psychology and Community Services Department.

Coursework in the Counseling Psychology Major (students entering with a Master's degree in Counseling or Psychology can transfer verified equivalent courses, except that COUN 501 can not be transferred):

- COUN 501 Ethics: Counseling and Counseling Psychology 3
- COUN 505 History of Psychology 3
- COUN 510 Counseling Methods 3
- COUN 515 Methods of Research 3
- COUN 516 Counseling Research Laboratory 1
- COUN 517 Psychological Testing 3
- COUN 518 Group Theory and Process 3
- COUN 519 Career Counseling 3
- COUN 530 Theories of Counseling, Personality and Development 3
- COUN 531 Psychology of Women, Gender and Development 3
- COUN 532 Multicultural Counseling 3
- COUN 540 Advanced Vocational Psychology 3
- COUN 551 Research Issues in Counseling Psychology 3
- COUN 552 Counseling Psychology Professional Seminar I 1
- COUN 553 Counseling Psychology Professional Seminar II 1
- COUN 554 Preparation for the Predoctoral Internship 1
- COUN 555 Advanced Psychometrics 3
- COUN 560 Supervision Theory and Technique 3
- COUN 568 Personality Assessment 3
- COUN 569 Cognitive Assessment 3
- COUN 580 Counseling Practicum 4
- COUN 583 Doctoral Practicum 3
- COUN 584 Community Counseling Internship 4
- COUN 585 Counseling Psychology Research Practicum 1-3
- COUN 586 Practicum in Supervision 1-3
- COUN 999 Dissertation 1-15
- COUN 995 Scholarly Project 2

Coursework in Research Methodologies (select one of the following options):

Option A

- PSYC 533 Theories of Learning 3
- PSYC 535 Physiological Psychology 3
- PSYC 537 Physiology of Behavior and Psychophysiological Measurement 3
- PSYC 539 Cognitive Psychology 3
- PSYC 551 Advanced Developmental Psych 3
- PSYC 560 Advanced Social Psychology 3

Option B

- EFR 516 Statistics II 3
- EFR 518 Multivariate Analysis 3

Option C

- PSYC 541 Advanced Univariate Statistics 3
- EFR 510 Qualitative Research Methods 3
- EFR 520 Advanced Qualitative Research Methods 3
Coursework in Diagnostic Assessment:

COUN 520 Diagnostic and Prevention Strategies in Counseling or PSYC 575 Behavior Pathology 3

Other Requirements:

1. Coursework/experiences to fulfill two Scholarly Tools;
2. Coursework/experiences in Interprofessional Health Care;
3. Accumulation of Supervised Experience in practices settings;
4. Successful completion of Comprehensive Examinations;
5. Successful defense of the Dissertation;
6. Competencies measured in the Comprehensive Multi-Dimensional Assessments (see Counseling Psychology Ph.D. Student Handbook);
7. Internship.

Cognate in the Department of Counseling Psychology and Community Services

A cognate in the Department of CPCS, consisting of a minimum of nine semester credits of counseling coursework, may be taken by master’s or doctoral students in related fields. Cognate coursework should be planned in consultation with a member of the department faculty. Cognates will not include practicum or internship; students interested in these experiences should consider a formal minor in Counseling (below).

Department Evaluation of Students

The CPCS faculty conduct periodic reviews of students’ progress in the MA and PhD programs, including their academic performance, counseling and psychoeducational skills, professionalism, and ethics. An interview may be required as part of the review. Deficits identified through faculty review may result in either a requirement that the student engage in remedial work or the removal of the student from the program.

As noted in Standard 7.04 of the 2002 Ethics Code of the American Psychological Association, students may need to disclose personal information if that information is necessary to evaluate or obtain assistance for students whose personal problems could reasonably be judged to be preventing them from performing their training or professionally related activities in a competent manner or posing a threat to the students or others.

The practice of counseling requires significant self-disclosure for the person receiving counseling. CPCS students must become very familiar with this process. Therefore, it is an essential training component of the Department to provide assignments and classroom experiences that call for student self-disclosure of a personal nature, in an atmosphere of respect and confidentiality, to an extent not expected in other academic disciplines. The nature or extent of expected self-disclosure is specified in each course syllabus.

Minor in the Department of Counseling Psychology and Community Services

A minor in the Department of CPCS consisting of a minimum of 20 semester credits of counseling coursework may be taken by master’s or doctoral students majoring in a related field. Such a minor should include the following five courses:

COUN 510 Counseling Methods 3
COUN 517 Psychological Testing 3
COUN 519 Career Counseling 3
COUN 530 Theories of Counseling, Personality and Development 3
COUN 532 Multicultural Counseling 3

All doctoral students who wish to complete a minor in the department must include a Counseling faculty member on the Faculty Advisory Committee and should seek advice about appropriate courses and course sequences.

Courses

COUN 501. Ethics: Counseling and Counseling Psychology. 3 Credits.
Focus will be on the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association, the Codes of Ethics and Standard of Practice of the American Counseling Association and corresponding ethics codes for subspecialties within the counseling profession. Students will learn to interpret these codes and apply them to professional practice, supervision, research and teaching situations. F.

COUN 502. Professional Issues in Counseling. 1 Credit.
An introduction to counseling practice and services in mental health, addiction, and other community agencies. Emphasizes professional issues in the field, professional development and career paths, and related topics. Corequisite: COUN 501; only for students in the Community Agencies Emphasis and Addictions Emphasis.

COUN 503. Professional Issues: Internship and Job Preparation. 1 Credit.
This course explores the characteristics of professional counselor preparation, including identity development, professional organizations, licensure and certification, career paths, specializations in the field, and continuing education. Preparation for counseling internship will also be explored. Prerequisite: COUN 502 or COUN 506. F.

COUN 505. History of Psychology. 3 Credits.
Historical development of modern psychology with an emphasis on philosophical precursors to psychology, experimental and systematic phases of early psychological thought, important issues in the development of psychology, and current and future trends. Prerequisite: Graduate standing in Counseling or Psychology.

COUN 506. Rehabilitation Counseling: Foundations and Ethical Issues. 3 Credits.
Comprehensive introduction to the rehabilitation profession, including past, present, and future trends. Areas emphasized: profession philosophy; organizational structure; historical and legislative influence; rehabilitation process and service delivery systems; professional issues, ethical codes, and behavior.

COUN 507. Life-Span Development in Counseling. 3 Credits.
This course examines the foundations of human development across the life span, including pre-natal issues, infancy, childhood, adolescence, adulthood, and aging. Theories that address biological neurocognitive, social, cognitive, cultural, and environmental issues of development will be examined. Structural theories of growth, maturation, and aging will be presented with an emphasis on strategies and interventions used by counselors to deal with developmental processes and transitions. F.

COUN 510. Counseling Methods. 3 Credits.
Two training components are combined to provide an intensive prepracticum experience. The didactic component introduces the basic interviewing and active listening skills; a laboratory component provides practice in the practical application of those skills in simulated counseling interviews.

COUN 514. Rehabilitation Counseling: Assessment and Evaluation. 3 Credits.
An introduction to assessment and related ethical issues in rehabilitation counseling. Assessment for vocational ability and independent living will be emphasized. Theory and research will be addressed, within a primarily applied framework.

COUN 515. Methods of Research. 3 Credits.
Methods and procedures of research development, design and analysis related to counseling and behavioral science. Experience in formulating and developing an individual research project. Considers research ethics and protection of human participants.

COUN 516. Counseling Research Laboratory. 1 Credit.
Introduces basic procedures in analysis of counseling research data. Topics including data coding, data entry and use of statistical packages are presented in an individualized manner. Repeatable to 2 credits. Prerequisite: COUN 515. S/U grading.

COUN 517. Psychological Testing. 3 Credits.
The application of principles of psychological measurement to selected instruments in the areas of intellectual functioning and aptitudes; educational and occupational achievements; career interests; and personality. Development of test interpretation skills.
COUN 518. Group Theory and Process. 3 Credits.
Addresses the principles and practices of support, task, psycho-educational and therapeutic groups with various populations in a multicultural context. Includes study of professional issues relevant to group processes. Involves participation and leading group experiences.

COUN 519. Career Counseling. 3 Credits.
An introduction to the psychology of careers and to the practice of career counseling. Career development theories, occupational classification systems, assessment instruments, and the use of occupational information for career education and life planning are included. Career counseling strategies for use with a diverse population are introduced.

COUN 520. Diagnostic and Prevention Strategies in Counseling. 3 Credits.
This course will focus on the assessment and diagnosis of individual psychiatric disorders as defined by classification systems such as the Diagnostic and Statistical Manual (DSM) and the International Classification of Diseases (ICD). Understanding of defined diagnostic disorders relative to the helping context will be emphasized. Knowledge of cultural concerns associated with classification systems will be explored. Emphasis will be placed on the following: assessment strategies designed to promote healthy human functioning; prevention strategies that focus on organizational/community/social justice advocacy; and the impact of diagnostic and prevention strategies on human functioning and wellness across the life span.

COUN 522. Management of School Counseling Programs. 2 Credits.
Study of the organization and administration of counseling programs in school settings, including foundations of program development and evaluation. Characteristics of effective school counselors. Consideration of professional and ethical concerns in school counseling.

COUN 523. Elementary School Counseling. 2 Credits.
Exploration of models of elementary counseling and examination of counseling materials in implementing a counseling program.

COUN 524. Middle School Counseling. 2 Credits.
Exploration of models of middle school counseling and examination of counseling materials in implementing a middle school counseling program.

COUN 525. Secondary School Counseling. 2 Credits.
Exploration of models of secondary school counseling and examination of counseling materials in implementing a secondary school counseling program.

COUN 526. Educational Collaboration. 3 Credits.
The course focuses on the knowledge and skills essential to the consulting/collaboration process for professional school counselors in order to effectively support student adjustment and achievement. Collaboration for school improvement, program implementation, and work with parents, educators and professionals in the community is emphasized. Prerequisite: Enrollment in School Counseling Distance Program or permission of instructor.

COUN 527. School-Based Family Counseling. 3 Credits.
The course provides an overview of relevant theoretical models, approaches and specific issues of families in order for school personnel to facilitate student adjustment and achievement. Prerequisite: Enrollment in School Counseling Distance Program or permission of instructor.

COUN 529. Dynamics of Addiction. 3 Credits.
The course emphasizes the addiction and recovery process including vulnerability factors, diagnosis and treatment, and relapse prevention of addiction disorders for individuals and families. Shared characteristics of behavioral and chemical addictions, addiction theory, research, and policy will be addressed.

COUN 530. Theories of Counseling, Personality and Development. 3 Credits.
Study and analysis of counseling interventions based on different theoretical models, emphasizing personality and human development. Course involves viewing videotapes of simulated or actual counseling sessions, role-play demonstrations, and role played practice of various theoretically based counseling interventions.

COUN 531. Psychology of Women, Gender and Development. 3 Credits.
This course presents current research and trends in development theory, particularly theories pertaining to the psychological development of women and men. Issues such as abuse, ageism, depression, eating disorders, emotional experience and expression, heterosexism, feminism, and multiculturalism will be examined as related to the practice of psychology. Learning methods include writing, music, film, group discussion and creative projects. On demand.

COUN 532. Multicultural Counseling. 3 Credits.
This course offers an introduction to counseling theories and interventions appropriate for American ethnic and non-ethnic minority clients. The values suppositions of various cultural groups will be examined. In-class group experience is included.

COUN 533. Couples And Family Counseling. 3 Credits.
Prerequisite: COUN 510 or consent of instructor.

COUN 540. Advanced Vocational Psychology. 3 Credits.
Advanced study of major career counseling theories, models, and methods. Prerequisites: COUN 519 or equivalent, and admission to doctoral program.

COUN 551. Research Issues in Counseling Psychology. 3 Credits.
This seminar is designed to increase students' self-efficacy and ability to examine critically research issues in Counseling Psychology and their relationship to practice. Students will further develop and demonstrate skills necessary to conduct the science of Counseling Psychology, including problem conceptualization, study design and the writing of proposals. Prerequisite: Admission to the doctoral program.

COUN 552. Counseling Psychology Professional Seminar I. 1 Credit.
An examination of the skills necessary for developing as a counseling psychologist trainee, with an emphasis on critical analysis, writing, and self-examination. Introduction to the breadth of competencies expected in counseling and professional psychology. Introduction to organizational and behavioral health consultation. Prerequisite: Admission to the doctoral program in Counseling Psychology.

COUN 553. Counseling Psychology Professional Seminar II. 1 Credit.
An introduction to the profession of Counseling Psychology, emphasizing the history of the specialty, the philosophical underpinnings of Counseling Psychology values, and the organizational structure of leadership in the discipline. Prerequisite: Admission to the doctoral program in Counseling Psychology.

COUN 554. Preparation for the Predoctoral Internship. 1 Credit.
A focused preparation of skills necessary for successful attainment of a predoctoral internship in Psychology. Emphasis on self-presentation and interview skills. Prerequisites: Admission to the doctoral program in Counseling Psychology or Clinical Psychology and permission of the instructor.

COUN 555. Advanced Psychometrics. 3 Credits.
This lecture/lab course allows students to become familiar with fundamental concepts of psychological measurement. The emphases of the course is on test development strategies based in classical testing theory, but also includes an introduction to item response theory. Additional purposes include gaining knowledge of APA standards of assessment and their application to the profession of Counseling Psychology and related fields. Finally, the application of psychometric theory to relevant assessment instruments and the cultural implications of these applications are addressed. Prerequisites: COUN 517 or equivalent, and admission to doctoral program. F. even years.

COUN 560. Supervision Theory and Technique. 3 Credits.
A survey and critical examination of approaches, techniques and issues in providing supervision and consultation. Includes reading of current theory and research on supervision and consultation, critical analysis of approaches to supervision, demonstrations, and role-played experiences of different supervision techniques. Prerequisite: Admission to the doctoral program in Counseling Psychology, the Master's program in Counseling, the doctoral program in Clinical Psychology or instructor permission.

COUN 561. Consultation Theory and Practice. 2 Credits.
This course provides an introduction to theories, models and practices of mental health and psychological consultation and collaboration. Consultant roles, for both program and case consultation, will be defined. Practices include initiating and developing a consultation relationship, developing a consultation contract, enacting the contract, and consultation process.

COUN 562. Consultation Laboratory. 1 Credit.
Under supervision by a member of the faculty, students will develop and implement a consultation project with an organization or client from the community. Prerequisite or Corequisite: COUN 561. S/U grading.

COUN 563. Advanced Application of APA Ethical Standards. 2 Credits.
This elective course is designed for students in the second or third year of doctoral study, those who have already completed some work with clients and are seeking an opportunity to think more critically about the application of ethical expectations to professional work. The course will emphasize the integration of ethical and legal standards and the implementation of such standards in case-based exercises.
COUN 564. Advanced Therapy Techniques. 3 Credits.
This elective course is designed for advanced students who are engaged in clinical practice and have completed COUN 530 (Theories of Counseling Personality and Development) or its equivalent. The course will provide focused discussion and application of various evidence-supported techniques to case material. Prerequisite: COUN 530.

COUN 565. Professional Seminars. 1-3 Credits.
Seminars are designed to present current research and supplement coursework in several areas. May be repeated up to eight credits. Repeatable to 8 credits. S/U grading.

COUN 568. Personality Assessment. 3 Credits.
Theory, research, evidence, and training in the administration, scoring, interpretation and use of personality assessment instruments. Clinical interviewing and checklists, behavioral observations and report writing issues. Issues of race, ethnicity, gender, age and disability in the use of these instruments is emphasized. A two-hour lab provides supervised practice in test administration and scoring. Prerequisites: COUN 517 or equivalent, and admission to the doctoral program or permission of instructor.

COUN 569. Cognitive Assessment. 3 Credits.
Theory, research, evidence, and training in the administration, scoring, interpretation and use of cognitive assessment instruments. Clinical interviewing and checklists, behavioral observations and report writing issues. Issues of race, ethnicity, gender, age and disability in the use of these instruments is emphasized. A two-hour lab provides supervised practice in test administration and scoring. Prerequisites: COUN 517 or equivalent, and admission to the doctoral program or permission of instructor.

COUN 580. Counseling Practicum. 2 Credits.
Introduction to counseling practice. Emphasis on development, improvement, and evaluation of counseling relationships. Interview skills in counseling practice with live supervision. Prerequisites: COUN 510 and Instructor permission. Prerequisite or Corequisite: COUN 530. Repeatable to 6 credits. F,S,SS.

COUN 581. School Counseling Practicum. 3 Credits.
Introduction to counseling practice in a school setting. Emphasis on improvement and evaluation of individual and group counseling relationships. Development of skills in applying the role of counselor to the school environment. Prerequisites: COUN 501, COUN 510 and COUN 530, or permission of the instructor; 10 completed COUN credits. S/U grading.

COUN 583. Doctoral Practicum. 2 Credits.
Participation in the activities of a counseling agency or similar appropriate organization. Continued development of counseling, assessment, and consultation skills with individuals, couples, groups, organizations, and communities in a multicultural context. Participation in small group and individual supervision and in case conferences. This course is graded as SP/UP. Repeatable to 12 credits. Prerequisite: Admission to doctoral program. Repeatable to 12 credits. F,S,SS.

COUN 584. Community Counseling Internship. 4 Credits.
Professional practice in counseling, assessment, consultation, teaching, or research in an approved community agency. Supervision must meet criteria established by the department and the Graduate School. Department permission needed for Summer Session enrollment. Graded SP/UP. Prerequisite: COUN 580. Repeatable to 8 credits. F,S.

COUN 585. Counseling Psychology Research Practicum. 1-3 Credits.
This course involves student participation in one of several, topical research groups conducted by faculty on an ongoing basis. Groups will design and carry out research studies, and prepare manuscripts for publication or presentation. May be repeated up to 8 credits. Repeatable to 8 credits. S/U grading.

COUN 586. Practicum in Supervision. 1-3 Credits.
Supervised experience in providing supervision to counselors-in-training. Experience may be gained in supervising beginning students in role-played labs, live supervision in practicum, individual supervision, and/or small group supervision of interns. May be repeated up to 6 credits. Prerequisite: COUN 560. Repeatable to 6 credits. S/U grading.

COUN 587. Addictions Counseling Internship. 4-6 Credits.
Professional practice in counseling, assessment, consultation, teaching, or research in an approved agency specializing in addictions counseling. Supervision must meet criteria established by the department and the Graduate School. Department permission needed for SS enrollment. Graded SP/UP. Prerequisite: COUN 580. Repeatable to 12 credits. F,S.

COUN 588. Rehabilitation Counseling Internship. 4 Credits.
Professional practice in counseling, assessment, consultation, teaching, or research in an approved agency specializing in rehabilitation counseling. Supervision must meet criteria established by the department and the Graduate School. Department permission needed for SS enrollment. Graded SP/UP. Prerequisite: COUN 580. Repeatable to 8 credits. F,S.

COUN 589. School Counseling Internship. 2-3 Credits.
Supervised internship in a school setting. Emphasis on observing and performing guidance and counseling methods and techniques. Knowledge and performance of the roles and duties of professional school counselors. Supervision must meet criteria established by the department and the Graduate School. Repeatable to 8 credits. Prerequisite: COUN 581. Repeatable to 8 credits. S/U grading.

COUN 590. Problems in Counseling. 1-3 Credits.
Supervised independent study or application of selected problems in the counseling field. Repeatable. S/U grading.

COUN 593. Readings in Counseling. 1-3 Credits.
Reading in selected areas of counseling. May be repeated up to six credits. Repeatable to 6 credits. S/U grading.

COUN 995. Scholarly Project. 1-2 Credits.
The scholarly project will be collaborative investigations by two or more students of a relevant topic within the Counseling profession. Before initiating the project students must obtain approval from designated faculty. Prerequisites: Enrollment in either the on-campus Counseling MA program or the School Counseling online program. Prerequisite or Corequisite: COUN 515. Repeatable to 3 credits. F,S,SS.

COUN 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

COUN 997. Independent Study. 2 Credits.

COUN 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

COUN 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

Criminal Justice

http://www.und.edu/dept/cjs/

FACULTY

UND: DiCristina, Gottschalk, Hume, Mayzer and Meyer (Graduate Program Director)

MiSU: Archambeault and Rabe

Degree Granted: Doctor of Philosophy (Ph.D.)

The Department of Criminal Justice at the University of North Dakota in partnership with the Department of Criminal Justice at Minot State University offers a graduate program of study leading to the degree of Doctor of Philosophy in Criminal Justice. The program is designed to prepare students for academic teaching and research, research in government service, and higher-level administrative positions in criminal justice agencies.

While retaining a traditional core of research and study on national and international issues in the administration of criminal justice systems, this program places special emphasis on the operation and administration of criminal justice agencies and systems in rural and American Indian Tribal jurisdictions. The program also offers a specialized program of study for those individuals holding a Juris Doctorate and wishing to meet educational requirements for teaching and research positions in criminal justice higher education programs.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.
Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals

The mission of the Department of Criminal Justice is broadly subsumed within the three functions of teaching, research and service to achieve the production and dissemination of knowledge guided by the principle of a just system of social regulation and control in the advancement of societal well-being. The goals of the teaching mission are achieved primarily through direct classroom instruction supplemented by experiential learning opportunities grounded in establishing foundations for lifelong learning. The research mission addresses both basic and applied research intended to contribute to the advancement of knowledge in the discipline of Criminal Justice as well as operational issues confronting criminal justice agencies and institutions. The Department of Criminal Justice meets its service mission through participation in departmental, college, and university governance, as well as involvement in professional and community activities that contribute to the betterment of the criminal justice discipline, the community and society.

Goal 1: Develop advanced analytic and communication skills.

Goal 2: Develop advanced understanding of criminological theories.

Goal 3: Develop an advanced understanding of statistics and research methods.

Goal 4: Develop an advanced understanding of various criminal justice relevant concepts.

Doctor of Philosophy (Ph.D.)

Admission Requirements

In addition to the admission requirements of the School of Graduate Studies, the following requirements must be met by all applicants with the exception of those applying under the J.D./Ph.D. specialization:

1. A master’s degree in criminal justice or a related field.
2. A cumulative G.P.A. of at least 3.0 for all coursework taken for graduate credit.
3. Achieve a minimum combined score of 300 on the verbal and quantitative components of the revised Graduate Record Exam (GRE), or a minimum combined score of 1,000 on earlier versions of the GRE.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Combined J.D/Ph.D Option: Students currently enrolled in an ABA accredited law school or individuals with a Juris Doctorate (J.D.) from an ABA accredited law school may be eligible for admission to the Ph.D. program in criminal justice. Interested individuals should contact the graduate program director for details.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Criminal Justice.

1. Complete a minimum of 60 credit hours beyond the master’s degree.
2. Complete 9 semester hours of criminological theory and 15 semester hours of doctoral level research methods/analysis.
3. Complete an additional 18 credit hours of electives of which:
   a. A minimum of 9 elective credits must be taken in criminal justice courses from the approved lists and not previously taken for graduate credit and,
   b. Up to 9 elective credits, not previously taken for graduate credit, may be selected from any courses approved for graduate credit at either the University of North Dakota or Minot State University.
4. Complete comprehensive examination in criminological theory and research methods/analysis prior to submission and approval of the dissertation prospectus.
5. Complete an examination in one area of specialization (to be determined in consultation with the student’s advisory committee).
7. Successfully defend a dissertation.

Required Curriculum:

**Theory**

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<td>CJ 510</td>
<td>Historical Perspectives in Criminology (UND)</td>
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<tr>
<td>CJ 511</td>
<td>Contemporary Perspectives in Criminology (UND)</td>
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<td>CJ 515</td>
<td>Human Nature and Crime (UND)</td>
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**Methods**

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<td>Topics in Research Methods (UND)</td>
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<td>CJ 522</td>
<td>Qualitative Research Methods in Criminal Justice (UND)</td>
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<td>CJ 525</td>
<td>Advanced Quantitative Methods/Analysis (UND)</td>
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<td>Special Topics in Quantitative Analysis (UND)</td>
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<td>CJ 690</td>
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**Electives (18 Credits, 9 of which must be from the following list)**

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<td>or CJ 635 (MiSU)</td>
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<td>CJ 540</td>
<td>Seminar in Criminal Justice Policy (UND)</td>
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<td>or CJ 640 (MiSU)</td>
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<td>CJ 545</td>
<td>Seminar in Rural Justice Issues (UND)</td>
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<td>CJ 555</td>
<td>Seminar in Tribal Justice Systems (UND)</td>
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<td>CJ 516</td>
<td>Theories of Punishment (UND)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 565</td>
<td>victimology (UND)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 592</td>
<td>(MiSU)</td>
<td>3</td>
</tr>
<tr>
<td>CJ 999</td>
<td>Dissertation (UND)</td>
<td>18</td>
</tr>
</tbody>
</table>

Total Program Hours 60

* In consultation with the student’s Advisory Committee, up to nine elective credits, not previously taken during studies leading to an M.A. or M.S. degree, may be selected from any courses approved for graduate credit at either the University of North Dakota or Minot State University.

J.D./Ph.D. Specialization

Option 1: Students who have successfully completed all requirements from an ABA accredited law school and have been awarded a Juris Doctorate (J.D.) degree may complete the Ph.D. in Criminal Justice through meeting the Theory and Methods/Statistics requirements of the doctoral program, successfully passing the comprehensive examination, and successfully defending a dissertation.

Option 2: Students currently enrolled in an ABA accredited law school may also complete requirements for the J.D./Ph.D. option. These students must successfully complete the Theory and Methods/Statistics components of the doctoral program, the comprehensive examination, and defend a dissertation. Students on this track must receive their J.D. prior to or coincident with receipt of their Ph.D.

Courses

**CJ 510. Historical Perspectives in Criminology. 3 Credits.** An overview of the development of western criminological thought from the enlightenment to the mid-twentieth century. The course examines viewpoints ranging from the demonic perspective to early learning, anomie/strain, social disorganization, labeling, and conflict theories.
CJ 511. Contemporary Perspectives in Criminology. 3 Credits.
An overview of developments in criminological thought from the mid-twentieth century to the present. The course examines the growth of mainstream viewpoints (e.g., anomie/strain, learning, and control theories) and critical criminology (e.g., Marxist, feminist, post-modern, and peacemaking perspectives). Prerequisite: CJ 510.

CJ 515. Human Nature and Crime. 3 Credits.
This course examines historical and contemporary applications of the concept of "human nature" in explanations of criminal behavior. Attention is also given to the role played by "human nature" in the evaluation of social institutions that react to crime and deviance. Finally, attempts to integrate biological and cultural explanations of human behavior as they pertain to crime will be addressed. Prerequisite: CJ 510.

CJ 516. Theories of Punishment. 3 Credits.
This course surveys the variety of attempts to describe, justify and explain punishment as a feature of human social life. Emphasis is placed on criminal punishment, but extra-legal punishments and their relationship to criminal punishments are also explored. Prerequisite: CJ 510.

CJ 520. Topics in Research Methods. 3 Credits.
An examination of philosophical underpinnings of the scientific method in social research. The course examines epistemological and ontological debates in contemporary social research and their application to research design. Repeatable.

CJ 522. Qualitative Research Methods in Criminal Justice. 3 Credits.
An examination of the underlying rationale, methods, and limitations of qualitative research in criminal justice. Topics include ethnographic research, action research, historical research, case studies, and content analysis.

CJ 525. Advanced Quantitative Methods/Analysis. 3 Credits.
This course is intended to familiarize students with advanced multivariate statistical techniques. Topics include regression analysis, factor analysis and path analysis. Other specific statistical analysis techniques may also be explored. Prerequisite: SOC 521 or consent of the instructor.

CJ 526. Special Topics in Quantitative Analysis. 3 Credits.
Variable topics exploring advanced statistical methods/analytical techniques such as time-series analysis, structural equation models, logistics regression, hierarchical linear modeling, categorical-data analysis and general linear models. Topics to be determined based on student demand. Prerequisite: CJ 525 or consent of instructor. Repeatable.

CJ 535. Seminar in Juvenile Justice. 3 Credits.
Variable topics addressing the administration of the juvenile justice system and juvenile justice policy. Course will consist of lectures, discussion, and readings. Repeatable to 9 credits. Prerequisite: Admission into Criminal Justice PhD program. Repeatable to 9 credits.

CJ 540. Seminar in Criminal Justice Policy. 3 Credits.
Variable topics addressing policy and policy development in the criminal justice system, including police, prosecution, courts, and corrections systems. Course will consist of lectures, discussion and readings. Repeatable to 9 credits. Prerequisite: Admission into Criminal Justice PhD program. Repeatable to 9 credits.

CJ 545. Seminar in Rural Justice Issues. 3 Credits.
Variable topics addressing issues in the administration of policing, prosecution, courts, and corrections in rural areas, course will consist of lectures, discussion and readings. Repeatable to 9 credits. Prerequisite: Admission into Criminal Justice PhD program. Repeatable to 9 credits.

CJ 555. Seminar in Tribal Justice Systems. 3 Credits.
Variable topics addressing the administration of criminal justice in Indian territory. Course will consist of lectures, discussion and readings. Repeatable to 9 credits. Prerequisites: Admission into Criminal Justice PhD program and IS 420. Repeatable to 9 credits.

CJ 565. Victimology. 3 Credits.
This course provides an analysis of the literature and research concerning criminal victimization. Attention will be directed toward current trends concerning the victim in the American criminal justice system with particular emphasis on measuring victimization, the impact of victimization and victim's rights and compensation initiatives. Prerequisite: Admission into Criminal Justice PhD.

CJ 594. Practicum: Research. 1-6 Credits.
This course is intended to place advanced students in criminal justice agencies as research analysts. Students will be under the supervision of a program faculty member and are expected to carry out research at the direction of an agency director or designee. Prerequisites: CJ 621 and consent of instructor. S/U grading.

CJ 597. Administrative Internship. 1-6 Credits.
Students are employed on a full-time or part-time basis in on-the-job assignments related to the administration of criminal justice agencies of federal, state or local governments. Students are required to produce an analytical report based on internship responsibilities. Prerequisite: Admission into Criminal Justice PhD program or consent of instructor. S/U grading.

CJ 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CJ 999. Dissertation. 1-12 Credits.
Original research project suitable for publication. Repeatable to 18 credits. Prerequisites: Successful completion of comprehensive exams and consent of department. Repeatable to 18 credits.

Earth System Science and Policy
http://essp.und.edu/

FACULTY: Hammond, Laguette (Chair), Romsdahl, Van Looy (Graduate Director), Zhang and Zheng

Degrees Granted: Master of Science (M.S.), Master of Environmental Management (M.E.M.), and Doctor of Philosophy (Ph.D.)

The graduate program in Earth System Science and Policy is organized around the field of Earth System Science and sustainability and offers three degrees: Master of Environmental Management, Master of Science, and Doctor of Philosophy. Sustainability science has emerged as an intellectually exciting, growing discipline that is a driving concept for major international scientific and environmental policy efforts. By bridging theory with practice, global and local perspectives, and scientific and social disciplines, sustainability science seeks to meet the needs of society while sustaining the life support systems of the planet.

ESSP Mission Statement
To provide an integrated and creative learning environment that fosters intellectual growth, critical thinking, and practical engagement in research and sustainable management of the Earth system and resources.

Departmental Goals
To fulfill the mission, the overall goal is to promote sustainability by pursuing:

1. Excellence in learning through a student-structured curriculum, a multi-disciplinary teaching approach, and experiential learning environments.
2. Excellence in discovery through research driven by societal needs and values and occurs within an Earth System Science paradigm
3. Excellence in engagement through outreach, service, and practical experience, which put knowledge related to Earth System Science and Policy to work.

The overall Student learning outcomes for all graduate degree programs are:

1. A breadth of knowledge in Earth System Science and Policy and the ability to apply that knowledge to address societal-driven sustainability science research, with a broad sense of ethical and professional responsibilities.
2. A strong knowledge of multi-scale processes, cutting-edge computer technology, geographical information systems (GIS), remote sensing, and quantitative analysis.
3. A strong knowledge of environmental policy, and environmental and resource economics related to human-environment interactions.
Earth System Science and Policy Recitation

Earth System Science and Policy Laboratory II
Earth System Science and Policy II

1. Written and oral communication skills that will facilitate the transfer of knowledge to support actionable decisions.
2. The ability to function within multi-disciplinary teams to accomplish common goals.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)
Mission Statement and Program Goals

The M.S. degree is a research oriented program which involves conducting a research project culminating in the defense of a thesis. The goal of the M.S. degree program is to prepare the students with the necessary skills to conduct research in the field of Earth System Science and Policy. This degree is designed to help the students develop a career in fields that require research capabilities. In conjunction with the six overall learning outcomes for the department, the M.S. students are able to:

1. Initiate scientific inquiry through critical evaluation of existing knowledge.
2. Synthesize and communicate the results of analysis in a coherent and well-structured report.

Master of Environmental Management (M.E.M.)
Mission Statement and Program Goals

The M.E.M. degree is a professional program which emphasizes practical experience especially through an internship. The goal of the M.E.M. degree program is to prepare the students develop the capabilities for a career in environmental management, sustainable development, or environmental policy. In conjunction with the six overall learning outcomes for the department, the M.E.M. students are able to:

1. Implement their knowledge into practical applications especially through a successful internship experience.
2. Holistically apply particular learned skill sets and acquire additional skills needed for development of a desired professional career path.

Doctor of Philosophy (Ph.D.)
Mission Statement and Program Goals

The Ph.D. degree is an advanced research oriented program which involves conducting original research culminating in the defense of a dissertation and in peer reviewed publications. The goal of the Ph.D. degree program is to prepare students for a career in innovative research and/or academia. This degree is designed to train students to become high level researchers who will generate new knowledge in the field of Earth System Science and Policy, and sustainability. In conjunction with the six overall learning outcomes for the department, the Ph.D. students are able to:

1. Critically evaluate and identify gaps in existing knowledge.
2. Generate rigorous scientific inquiry that is original and bridges the identified gap in scientific knowledge.
3. Synthesize and communicate the results of research in the form of a dissertation, peer reviewed publication(s), and professional presentations.

Master of Science (M.S.)
Admission Requirements

Applicants who are seeking admission to School of Graduate Studies must meet all of the minimum general education requirements identified in the graduate catalog. In addition, students must fulfill the requirements below for admission to Earth System Science and Policy M.S. degree program.

1. Hold a bachelor’s degree from an accredited college or university.
2. Have satisfactorily completed a minimum of college-level algebra plus 3 credits of college statistics or calculus.
3. Have completed a minimum of 12 semester credits in the natural or physical sciences, e.g., physics, chemistry, geosciences, biology or related sciences.
4. Have earned a minimum average GPA of 3.00 on a 4.00 scale, on all upper division college-level coursework.
5. Submit score from the Graduate Record Examination (GRE) General Test.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Earth System Science and Policy Department.

The overarching goal of all the degree programs offered in Earth System Science and Policy is to facilitate the acquisition of skills required to solve environmental problems or to seize opportunities presented by a changing environment. Much of the responsibility for learning rests upon the student.

1. Students enrolled in the MS program will take the following sequences.
   Students will complete the basic two-semester core sequences of courses during their first year of study.

   **Degree Requirements**
   - ESSP 501 Earth System Science and Policy I
   - ESSP 501R Earth System Science and Policy Recitation
   - ESSP 501L Earth System Science and Policy Laboratory I
   - ESSP 502 Earth System Science and Policy II
   - ESSP 502R Earth System Science and Policy Recitation II
   - ESSP 502L Earth System Science and Policy Laboratory II

2. A minimum of 36 credits beyond the baccalaureate is required, including six to nine credits for thesis.
3. At least one-half of the credits must be at or above the 500 level.
4. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
5. By the end of the first semester the student will select a chair of her/his Advisory Committee and, in consultation with that chair, recommend membership on the Advisory Committee. The Advisory Committee will have 3 members, at least two of whom must be from the ESSP faculty. If the student is pursuing a minor concurrently with the MS in ESSP, one of the committee members will be from the department of the minor.
6. Students must file with the School of Graduate Studies an approved program of study before the completion of fifteen credits of coursework.
7. Students must maintain a GPA of 3.00, and comply with the requirements of the School of Graduate Studies. Grades poorer than "C" will not be accepted as fulfilling degree requirements.
8. MS student must complete oral and written examinations to qualify for candidacy in the Master of Science program. These will occur no later than the end of the first year of coursework and will entail a 15 to 30 page written description and an oral presentation of their intended research project.
9. Successful completion, and oral defense, of a thesis is required for the MS degree.
10. All exams will be administered and evaluated by the student’s Advisory Committee.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ESSP 501</td>
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<td>ESSP 501R</td>
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<td>ESSP 501L</td>
<td>2</td>
</tr>
<tr>
<td>ESSP 502</td>
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</table>
Master of Environmental Management (M.E.M.)

Admission Requirements

Applicants who are seeking admission to School of Graduate Studies must meet all the minimum general education requirements identified in the graduate catalog. In addition, students must fulfill the requirements below for admission to Earth System Science and Policy M.E.M. degree program.

1. Hold a Bachelor’s degree from an accredited college or university.
2. Have satisfactorily completed a minimum of college-level algebra plus 3 credits of college statistics or calculus.
3. Have completed a minimum of 6 semester credit hours in natural sciences and 6 semester credits in social sciences, e.g., economics, sociology, psychology, political science, anthropology/archeology, or related fields.
4. Have earned a minimum average GPA of 3.00 on a 4.00 scale, on all upper division college-level coursework.
5. Submit score from the Graduate Record Examination (GRE) General Test.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Environmental Management degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Earth System Science and Policy Department.

The overarching goal of all the degree programs offered in Earth System Science and Policy is to facilitate the acquisition of skills required to solve environmental problems or to seize opportunities presented by a changing environment. Much of the responsibility for learning rests upon the student.

1. Students enrolled in the MEM program will take the following sequences. Students will complete the basic two-semester core sequence of courses during their first year of study.

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<th>Course Sequence</th>
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<th>Credits</th>
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2. A minimum of 36 credits, including three to nine credits for Internship is required.
3. At least one-half of the credits must be at or above the 500 level.
4. A maximum of one-fourth (usually 9-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
5. By the end of the first semester the student will select a chair of her/his Advisory Committee and, in consultation with that chair, recommend membership on the Advisory Committee.
6. Students must file with the School of Graduate Studies an approved program of study before the completion of fifteen credits of coursework.
7. Students must maintain a GPA of 3.00, and comply with the requirements of the School of Graduate Studies. Grades poorer than “C” will not be accepted as fulfilling degree requirements.
8. Complete written and oral comprehensive examinations to qualify for candidacy in the MEM program. These will occur no later than one month before leaving for the internship and will entail a 5 to 15 page written description and an oral presentation of their intended internship project.
9. In place of a thesis, MEM students must submit a comprehensive written report of their internship with an appropriate organization. The written report will be in the form of an Independent Study Report, following the guidelines and procedures for such a report set by the School of Graduate Studies. Students shall make a final oral presentation to an audience from the ESSP program, stakeholders affected by their project, and relevant professionals.
10. All exams will be administered and evaluated by the student’s Advisory Committee.

Doctor of Philosophy (Ph.D.)

Admission Requirements

Applicants who are seeking admission to School of Graduate Studies must meet all of the minimum general education requirements identified in the graduate catalog. In addition, students must fulfill the requirements below for admission to Earth System Science and Policy Ph.D. degree program.

1. Hold a Master’s degree from a recognized college or university.
2. Have satisfactorily completed a minimum of college-level algebra plus 3 credits of college statistics or calculus, AND a minimum of 12 semester credit hours in natural or physical sciences, e.g., physics, chemistry, geosciences, biology or related sciences, AND 6 semester credits in social sciences, e.g., economics, geography, environmental studies, sociology, psychology, anthropology, archeology, political science or related fields.
3. Have earned a minimum average GPA of 3.50 on a 4.00 scale on all graduate-level coursework.
4. Submit score for the Graduate Record Examination (GRE) General Test.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctorate degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Earth System Science and Policy Department.

The overarching goal of all the degree programs offered in Earth System Science and Policy is to facilitate the acquisition of skills required to solve environmental problems or to seize opportunities presented by a changing environment. Much of the responsibility for learning rests upon the student.

1. Students enrolled in the PhD program will take (in most cases) the following sequences. Students will complete the basic two-semester core sequence of courses during their first year of study.

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<th>Course Sequence</th>
<th>Course Title</th>
<th>Credits</th>
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2. A minimum of 90 credits (30 of which must be taken in the Earth System Science and Policy Program) beyond the baccalaureate, including acceptable master’s degree work, and up to 18 credits for dissertation is required for the PhD degree.
3. PhD students will be required to spend a minimum of two semesters, full-time, on the UND campus after receiving a master’s degree.
4. Students must complete at least 6 credits of approved academic work per year.
5. By the end of the first semester in the doctoral program, the student will select a chair of her/his Advisory Committee. By the end of the second semester, the student will select membership of the Advisory Committee, in consultation with the chair. The Advisory Committee will have at least five members, at least three of which must be from the ESSP faculty. One of the committee members will be appointed by the Dean of the
School of Graduate Studies. That member will be from outside the ESSP Department. The committee will assist the student in course selection and definition of a research topic and will also administer and evaluate all examinations that are required for completion of the degree.

6. ESSP PhD students must file with the School of Graduate Studies an approved program of study by the end of their second semester.

7. Students must maintain a GPA of at least 3.00 with no grades below “B” and comply with the requirements of the School of Graduate Studies. Any student whose GPA falls below 3.00 will be placed on probation and will have one semester to raise the GPA to 3.00 or above.

8. All students must take a qualifying exam to advance to candidacy in the PhD program. Part of the written requirement requires all students to write a dissertation proposal in a style appropriate for submission to a funding organization or agency. Students will present their proposal for review no later than two years from the date of admission to the ESSP doctoral program. To be advanced to candidacy the PhD student will also take a qualifying exam, which will be administered early in the student’s second year. Successful completion, and oral defense, of a dissertation is also required for the PhD degree.

9. All exams will be administered and evaluated by the student’s Advisory Committee.

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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<td>Earth System Science and Policy Recitation</td>
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<tr>
<td>ESSP 501L</td>
<td>Earth System Science and Policy Laboratory I</td>
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<tr>
<td>ESSP 502</td>
<td>Earth System Science and Policy II</td>
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<tr>
<td>ESSP 502R</td>
<td>Earth System Science and Policy Recitation II</td>
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<td>ESSP 999</td>
<td>Dissertation</td>
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<td>Total Credits</td>
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<td>56-124</td>
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</table>

1. Courses

ESSP 501. Earth System Science and Policy I. 5 Credits.
An overview of the fundamental issues from five research areas: Biodiversity and Ecosystem Functioning; Climate and Environmental Change; Land and Resource Management; Environmental Policy, Management, and Communication; and Human Health and the Environment. Material will be presented “situationally” in a problem-based learning environment. ESSP faculty and guest lecturers will present background information relevant to the topics. Students are expected to engage actively in the learning process by 1) determining what further information they need to understand the problem, 2) researching the questions, 3) clearly and concisely presenting the findings of their research to one another. Prerequisites: Graduate standing in ESSP. Corequisites: ESSP 501R and ESSP 501L.

ESSP 501L. Earth System Science and Policy Laboratory I. 2 Credits.
Laboratory session. Will require one or more full day field trips; may require one or more weekend field trips. Prerequisites: Graduate standing in ESSP. Corequisites: ESSP 501 and ESSP 501R. S/U grading.

ESSP 501R. Earth System Science and Policy Recitation. 3 Credits.
Small group discussions to include many parties to an environmental issue. Prerequisites: Graduate standing in ESSP. Corequisites: ESSP 501 and ESSP 501L. S/U grading.

ESSP 502. Earth System Science and Policy II. 5 Credits.
Course follows the design of ESSP 501 but with more emphasis on written reports and team projects. At the beginning of the semester, students will either select or be assigned a topic for an interdisciplinary team project for completion by the end of the semester. The project team helps students acquire an interdisciplinary outlook, and fosters communication and cooperation within a positive multi-disciplinary work environment. This will provide students with skills that are integral to the management of complex environmental problems they will face in the world beyond academia. Prerequisites: ESSP 501, 501R and 501L. Corequisites: ESSP 502R and ESSP 502L.

ESSP 502R. Earth System Science and Policy Recitation II. 3 Credits.

ESSP 506. Ecosystem Services: Valuing Nature in a Market Society. 3 Credits.
Analyzes the services and goods provided by natural and human-made ecosystems with a primary focus on the agroecosystems and grasslands of the northern Great Plains. Explores the scientific framework of ecosystem services, their disruption or disturbance, economic and ecological values, methods of analyzing these values, and policy implications. Prerequisite: Consent of instructor.

ESSP 520. Earth Systems Modeling. 3 Credits.
Introduction to statistical and deterministic approaches for modeling earth systems, including use of modeling to support management and policymaking. Develops systems thinking skills and emphasizes modeling as a framework for environmental analysis and problem solving. Students will learn how different classes and scales of models are used to explore different type of environmental questions. Emphasis will be on the dynamic, interdependent and interactive relationships between human activities and ecosystem function and structure as well as the effects of these activities on biogeochemical cycles, energy flow, and biodiversity. Students will use these analyses to evaluate opportunities to shift toward more sustainable human behavior. Prerequisite: Graduate standing in ESSP or consent of instructor.

ESSP 530. Principles of Environmental Science. 3 Credits.
Provides a basis for understanding the complex responses of plants and animals to environmental change and presents clear explanations and analysis of interactions between organisms and their physical environment. Students will learn the physical principles that explain key Earth system processes, such as water cycle and energy cycle, and key interactions, such as radiative forcing. More importantly, students will learn principles that apply in conducting research and in the interpretation of measurements. Even though this graduate level course is intended for students who are expected to conduct research toward their degree, non-thesis graduate students are also encouraged to enroll as it covers a wide range of physical topics associated with Earth System Science. Prerequisites or Corequisites: Statistics, Calculus, College Physics, and permission of the instructor.

ESSP 540. Advanced Topics in Geospatial Technologies. 3 Credits.
The course’s intent is to stay abreast of technological developments in a rapidly evolving field. Course contents will vary according to where the advances have the most immediate impact. The goal is to provide students exposure and hands-on experience needed to apply technologies to significant Earth System problems. Among technologies to be discussed are sensors for satellites and airborne platforms, image processing and image analysis, and the use of Geographic Information Systems. Prerequisite: Consent of instructor.

ESSP 552. Environmental Economics, Policy and Management. 3 Credits.
Examines the principles of economics, natural resource limitations and management, and the role of science in public policy decision-making with the intent of preserving Earth's vital life-support systems while meeting human needs and aspirations. Through case studies, guest speakers, and personal experience, students will learn how science does or does not inform environmental policy making. Students apply economic theory and analysis to evaluate environmental problems and policies and apply ecological principles to shape economic policy. Particular emphasis will be on wetland habitats and agroecosystems. Prerequisite: Consent of instructor.

ESSP 550. Colloquium Series. 1 Credit.
Speaker series, approximately weekly, on timely topics and research. An emphasis will be to hear from outside speakers. Speakers may occasionally deliver presentations electronically. Graduate students in ESSP are expected to attend. S/U grading.
Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university.
2. An overall undergraduate grade point average of 2.75 or greater for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on a 4.0 scale).
3. Official scores from the Graduate Record Examination (GRE) General Test or Graduate Management Admission Test (GMAT). At the discretion of the MSAE Program Director, test scores may be waived for students holding a graduate degree in a business or STEM related field from an AACSB accredited institution.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. Applicants may be eligible for admission in “Qualified” status with six credits of requisite undergraduate work provided that they meet all other stated admission criteria. In such cases, the student must satisfy all conditions in her/his admission letter in order to advance to “Approved” status. Failure to address the conditions of admission as stated in the admission letter will be viewed as unsatisfactory progress and could result in dismissal from the School of Graduate Studies.
7. ECON 416 Mathematics for Economists and ECON 411 Economic Forecasting are the two courses that students in the combined program are permitted to count toward both a UND bachelor’s degree and the MSAE degree, but only if these courses are declared for graduate credit. All other courses taken for credit in the combined program must satisfy only bachelor’s program requirements, or only MSAE program requirements.

Combined BS/MSAE Option: A combined BS/MSAE option is available to outstanding undergraduates who have completed 50 semester hours in a bachelor’s program at UND. Interested students should consult with the MSAE Program Director.

Degree Requirements

Students seeking the Master of Science in Applied Economics degree through the Department of Economics & Finance at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Economics & Finance.

The MSAE curriculum varies according to whether the student chooses a non-thesis option or a thesis option (see below). The non-thesis option is the program default and is meant to provide rigorous training in economic analysis and data analytics to students aspiring to become economic practitioners (e.g., consultants, analysts). The thesis option is available for students who seek to conduct original research. The thesis option is primarily targeted towards students planning to pursue further graduate work (e.g., Ph.D.) in Economics or related areas.

Thesis topics must be approved by the student’s faculty advisory committee, conducted under the guidance of the student’s faculty advisor, and then completed to the satisfaction of the faculty advisory committee. Students on the non-thesis track will complete an independent study which serves as a capstone for the program. The independent study allows the student to demonstrate her command of the methods and perspectives taught in the program in investigating a substantive problem. In contrast with the thesis, the non-thesis option includes fewer credits, but it provides flexibility and allows students to tailor their coursework to their specific interests.

Non-Thesis option (minimum of 30 credit hours)

Required core courses:

- ECON 411 Economic Forecasting 3
- ECON 416 Mathematics for Economists 3
- ECON 504 Advanced Price Theory 3
- ECON 505 Advanced Macroeconomic Theory 3
- ECON 506 Econometrics (Econometrics) 3
- ECON 534 Applied Economic Analysis 3
- ECON 997 Independent Study 3
- Electives* 9

Total Credits 30

*Electives (minimum of 9 credit hours):

Choices of cognate electives must be determined in consultation with and approved by the MSAE program director. Courses previously taken from UND for undergraduate credit may not be used to satisfy MSAE requirements.
The MSAE is designed to be completed in one and a half years of full-time study. The non-thesis option requires a minimum of 30 credits hours while the thesis option requires a minimum of 34 credits hours. Below is the recommended course schedule of completion.

**Thesis Option (minimum of 34 credit hours)**

**Required core courses:**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 411</td>
<td>Economic Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 416</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>ECON 504</td>
<td>Advanced Price Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 505</td>
<td>Advanced Macroeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 506</td>
<td>Econometrics (Econometrics)</td>
<td>3</td>
</tr>
<tr>
<td>ECON 534</td>
<td>Advanced Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ECON 596</td>
<td>Applied Economics Research Seminar</td>
<td>3</td>
</tr>
<tr>
<td>ECON 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
</tbody>
</table>

**Electives**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Electives (minimum of 9 credit hours):</td>
<td></td>
</tr>
</tbody>
</table>

Choices of cognate electives must be determined in consultation with and approved by the MSAE program director. Courses previously taken from UND for undergraduate credit may not be used to satisfy MSAE requirements.

**Outline of Full-Time Course Schedule**

The MSAE is designed to be completed in one and a half years of full time study. The non-thesis option requires a minimum of 30 credits hours while the thesis option requires a minimum of 34 credits hours. Below is the recommended course schedule of completion.

**First Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 416</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>ECON 506</td>
<td>Econometrics (Econometrics)</td>
<td>3</td>
</tr>
<tr>
<td>ECON 504</td>
<td>Advanced Price Theory</td>
<td>3</td>
</tr>
<tr>
<td>Elective 1</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits**

12

**Spring**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 411</td>
<td>Economic Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 505</td>
<td>Advanced Macroeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 534</td>
<td>Applied Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Elective 2</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits**

12

**Summer**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 596</td>
<td>Applied Economics Research Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits**

3

**Second Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 997</td>
<td>Independent Study **</td>
<td>3</td>
</tr>
<tr>
<td>ECON 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
<tr>
<td>Elective 3</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits**

10

**Total Credits**

30 or

34

*If pursuing thesis option. **If pursuing non-thesis option.
ECON 580. Economic Development: Global, National, and Regional Issues. 3 Credits.
The first part of this course focuses on growth theories, globalization and economic development and sustainable growth among less developed, developing, and more developed countries, as well as countries in transition to market economies. The second part of the course specifically examines economic development for advanced nations, incorporating rural, urban and regional economic analysis. Issues such as rural technology, employment, poverty, housing, transportation, location problems, industrialization, urbanization and sustainable growth in North Dakota and North Central Region are explored. Prerequisite: Department consent. F.

ECON 592. Research in Economics. 2-3 Credits.
Research work and use of original documents; collecting of material and preparing of special topics and bibliographies; familiarizing the student with government publications and other material available for study of economic problems.

ECON 596. Applied Economics Research Seminar. 3 Credits.
Seminar course intended to strengthen and further develop essential skills of research and formal presentation (written and oral) for both academic and professional audiences. Students will apply these skills to the development of their individual Independent Study or Thesis Project Proposal. Enrollment is restricted to MSAE degree students who plan to complete their Independent Study or Thesis in the following academic year. SS.

ECON 597. Economic Research Internship. 1-3 Credits.
An internship is designed to provide the student with an opportunity for participating in a supervised work experience directly related to the field of training. Students will work closely with the program adviser in planning the internship with an approved cooperating institution. Prerequisite: Permission of program director. Repeatable to 3 credits. F,S,SS.

ECON 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ECON 997. Independent Study. 3 Credits.
The independent study is a capstone for MSAE students on the non-thesis track. The course requires the student to investigate a topic or research question in applied economics that is assigned by the instructor. The student will prepare a research paper demonstrating his/her ability to creatively apply the various methods and perspectives taught in the MSAE program in addressing the assigned problem. Students will also be required to develop a presentation for their paper. F.S.

ECON 998. Thesis. 4 Credits.
The thesis is an original research project completed under the supervision of a thesis committee.

Undergraduate Courses for Graduate Credit

ECON 324. Public Finance. 3 Credits.
Growth and effects of the public sector of the economy emphasizing effects of taxation and spending or borrowing and debt management on efficiency and use of economic resources. Prerequisites: ECON 201 and ECON 202.

ECON 338. International Economics. 3 Credits.
Economic basis for gain in international trade; capital and population movements; international disequilibrium and the process of balance-of-payments adjustments; tariffs, underdeveloped countries. Prerequisites: ECON 201 and ECON 202. F,S.

ECON 341. Labor Economics and Labor Relations. 3 Credits.
A survey of the nature and causes of the economic problems of the American wage and salary earner and of the attempts of wage earners and society, through organizations and legislation, to alleviate these problems. The course comparatively surveys the history and systematic theories of labor movements and the market and institutional influences on wages and employment. Particular emphasis will be placed on the law of industrial relations, employment and income access, and the adjustment of labor disputes. Prerequisites: ECON 201 and ECON 202. F.

ECON 355. Government Regulation of Business. 3 Credits.
An exploration of the many ways that federal and state governments regulate business activity. Government regulation falls into three broad areas: economic regulation; social regulation; antitrust laws. The historical development of regulation, from both a legal and economic perspective, will be discussed. Particular attention will be paid to the current trend toward deregulation of previously regulated industries such as airlines, telecommunications, and trucking. Prerequisites: ECON 201 and ECON 202. F.

ECON 400. History of Economic Thought. 3 Credits.
Broad overview of the major schools of thought including Mercantilist, Physiocrat, Classical, Marxian, Socialist, Historical, Austrian, Neoclassical, Institutional, Keynesian, and Monetarist. The coverage includes value theory, income/expenditure theory, growth/development theory, scientific method, scope and public policy. Prerequisites: ECON 105 or ECON 201, and ECON 202. S.

ECON 410. Empirical Methods in Economics I. 3 Credits.
This course is an introduction to econometrics, the joint area of economics and statistics dealing with the application of statistics to economic problems. The course objectives are to acquire a basic understanding of the theory and methods of econometrics and to gain practical experience in utilizing these methods. The students will use the tools developed in the course in homework and written assignments so that they can develop an insight to theory and its application. Prerequisites: ECON 201, ECON 202 and ECON 210. F.

ECON 411. Economic Forecasting. 3 Credits.
An introduction to Economics Forecasting and Time Series Analysis. The course will cover specifications and estimation of ARMA models, seasonality, non-stationarity, unit roots and forecast evaluations. Empirical applications are used throughout the course. Prerequisite: ECON 410 or ECON 506. S.

ECON 416. Mathematics for Economists. 3 Credits.
Study of mathematical methods in the areas of introductory calculus and linear algebra, and their application to economic analysis. Mathematical analysis of static and dynamic equilibrium models, growth models, distribution, production functions, cycles, activity analysis, mathematical programming, and model building. Prerequisites: ECON 308 and ECON 309; MATH 146 or MATH 165. On demand.

ECON 438. International Money and Finance. 3 Credits.
Identification of key international financial concepts and analysis of their relationships in the international money and capital markets; determination of the balance of payments and exchange rates; and examination of alternative organizations of the international monetary system. Prerequisite: ECON 303. F.

Education

http://www.und.edu/dept/ehd/


Graduate programs in education are housed in three departments of the College of Education and Human Development. Faculty in the Departments of Educational Foundations and Research, Educational Leadership, and Teaching and Learning work closely together in design and delivery of the graduate programs described in this section. The department chairs and program coordinators are listed below.

Department Chairpersons

Educational Foundations and Research
M. Weaver-Hightower

Educational Leadership
G. Ingwalson

Teaching and Learning

Graduate Directors

Early Childhood Education
K. Votava

Curriculum and Instruction
J. Holen

Educational Foundations and Research
C. Hunter

Educational Leadership PK-12
P. Stonehouse

Emphasis

Elementary Education
B. Gourneau

English Language Learner Education
J. Shafer

Higher Education (EDL)
M. Healy

Instructional Design and Technology
W. Hung

Reading Education
P. Beck
Graduate programs in education at UND are accredited by the Council for Accreditation of Educator Preparation (CAEP) through 2022, and those leading to teacher licensure or endorsement or to an advanced educator credential are approved by the North Dakota Education Standards and Practices Board.

**Design of Graduate Programs: Critical Inquiry**

The College of Education and Human Development admits students to advanced programs who are self-directed learners. Viewing knowledge as holistic, interconnected, and never fully defined, we encourage students to define their own programs of study within the framework of critical inquiry.

Critical inquiry begins as students, individually or in groups, identify and seek resolution to problems in education. Students engaged in critical inquiry observe and try to understand differences in proposed resolutions to problems; explore problem situations and the consequences of various resolutions; seek further definition of issues through reading, interaction, research, and creative activity; and further professional abilities consistent with their own understandings of directions for policy and practice in education. Foundational studies in education and the study of research methodologies contribute to student’s ability to engage in critical inquiry.

Goals that inform graduate programs for teachers are drawn from the core propositions of the National Board for Professional Teaching Standards and from the appropriate state or national discipline-specific standards.

### Programs Offered

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Childhood Education</td>
<td>M.S.</td>
</tr>
<tr>
<td>Educational Foundations &amp; Research</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Educational Leadership</td>
<td>M.Ed., Ed.S., Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Curriculum and Instruction</td>
<td>M.S.</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>M.Ed., M.S.</td>
</tr>
<tr>
<td>English Language Learner Education</td>
<td>M.Ed.</td>
</tr>
<tr>
<td>Higher Education (EDL)</td>
<td>M.S., Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Instructional Design and Technology</td>
<td>M.Ed., M.S.</td>
</tr>
<tr>
<td>Reading Education</td>
<td>M.Ed., M.S.</td>
</tr>
<tr>
<td>Special Education</td>
<td>M.Ed., M.S.</td>
</tr>
<tr>
<td>Teaching and Learning</td>
<td>Ed.D., Ph.D.</td>
</tr>
</tbody>
</table>

Details pertaining to admission requirements, degree requirements and courses offered can be found in each of the departmental sections.

### Admissions Process

Success in the graduate study of education is related to qualities of mind, motivation, literacy, and experience. Among the qualities of mind sought in candidates for admission to Education programs are creativity, intelligence, independence of thought, willingness to take risks, openness to new ideas, openness to diversity, and flexibility of thought. Motivation is demonstrated by commitment to learners of all ages, professional growth, self-direction, and commitment to academic study leading to a graduate degree. Literacy is the ability to communicate effectively both orally and in writing. Experience may be demonstrated by diverse activities including work with children or adults in a variety of settings, foreign or domestic travel, and a liberal education. Each student brings a different mix of characteristics and strengths to graduate study.

Within the catalog, each graduate program lists specific admission requirements. Consult the website for up-to-date admissions processes for each program. Research methods must be selected from approved courses that provide the scholarly tools to support research.

### Scholarly Tools

The scholarly tool requirement for the M.S., Ed.S., Ed.D., and Ph.D. degrees is an integral part of the graduate degree program. Since the purpose of the scholarly tool requirement in graduate study is to enable the student to read, understand and conduct research, the tools are to be directly related to the research interests of each graduate student. Achievement levels will be demonstrated by satisfactory completion of coursework in the appropriate scholarly tool area(s) or by a proficiency examination. A minimum of five semester credits in appropriate coursework for the M.S. degree is required.

There is no scholarly tool requirement for the M.Ed. or Ed.S. degrees. For the Ph.D., the minimum scholarly tool requirements of 12 credits may be met by one of the following options:

**Option 1: Qualitative emphasis option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 510 Qualitative Research Methods (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 520 Advanced Qualitative Research Methods (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 516 Statistics II (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Approved Electives (including EFR 514 Discourse Analysis)</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>12</td>
</tr>
</tbody>
</table>

**Option 2: Quantitative emphasis option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 510 Qualitative Research Methods (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 516 Statistics II (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>EFR 517 Advanced Research Methodologies (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 518 Multivariate Analysis (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 519 Research Seminar (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>12</td>
</tr>
</tbody>
</table>

**Option 3: Tests and measurements option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 511 Program Evaluation (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 512 Educational Tests and Measurements (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 516 Statistics II (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 517 Advanced Research Methodologies (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>12</td>
</tr>
</tbody>
</table>

The student’s advisory committee may approve an exception to these three specializations upon consultation with the research faculty. An appropriate exception would be a different sequence of studies that assures breadth and depth in the research process that is related to both the student’s career goals in research and in regard to the student’s research.

For the Ed.D., the minimum scholarly tool requirements of six credits may be met by one of the following options:

**Option 1: Qualitative emphasis option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 510 Qualitative Research Methods (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>EFR 520 Advanced Qualitative Research Methods (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>6</td>
</tr>
</tbody>
</table>

**Option 2: Quantitative emphasis option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 516 Statistics II (or equivalents)</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>EFR 517 Advanced Research Methodologies (or equivalents)</td>
<td>3</td>
</tr>
</tbody>
</table>
Education

Graduate Certificate Program in College Teaching

Purpose
This certificate program targets faculty (full-time and adjuncts), as well as graduate students who wish to become professors, college instructors, and academic advisors as well as individuals who are teaching or want to teach in college settings.

Objectives
Students will:

- gain knowledge of pedagogical approaches
- experience and demonstrate effective teaching skills
- connect institutional and departmental missions as well as disciplinary norms
- foster ethical behaviors and professional standards
- understand the complexities of the academic profession
- identify emerging trends in college teaching excellence
- participate in professional forums as a means to enhance knowledge and practice of effective teaching.

Admission Requirements
Hold a baccalaureate degree from an accredited university

1. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 on a 4.0 scale

Program Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 539</td>
<td>College Teaching</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 548</td>
<td>The Professoriate</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 545</td>
<td>Adult Learners</td>
<td>3</td>
</tr>
<tr>
<td>or T&amp;L 544</td>
<td>Assessment in Higher Education</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 546</td>
<td>College Students with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 584</td>
<td>Internship in Education</td>
<td>1-8</td>
</tr>
</tbody>
</table>

Note: If a student has taken both T&L 544 and T&L 545, one will count under Required courses and the other will count under the Elective courses.

Total Credits 12

For Further Information:
Please contact Dr. Myrna R. Olson, College Certificate Program Coordinator, Department of Teaching and Learning, College of Education and Human Development, Mailstop 7189, 231 Centennial Drive, University of North Dakota, Grand Forks, North Dakota 58202. Telephone: 701-777-3188; Email: myrna.olson@email.und.edu

Autism Spectrum Disorders (ASD) Graduate Certificate

Admission Requirements

1. Online application and fee of $35 (the application fee is waived for McNair Scholars).
2. One official copy of ALL college and/or university academic transcripts.

ASD Graduate Certificate

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
<td>3</td>
</tr>
<tr>
<td>SPED 561</td>
<td>Methods for Autistic Spectrum Disorder</td>
<td>3</td>
</tr>
</tbody>
</table>
Certificate in ELL Education

The Certificate in ELL Education program offers a 20-credit, seven-course sequence that fulfills the requirements for the North Dakota ELL teacher endorsement. The program may be completed in three semesters. This program is for those who do not need or want a full master’s program, but who want documentation of their studies in the field.

**Required Courses:**
- T&L 513 Linguistics for ELL Teachers 3
- T&L 522 Mathematics in the Elementary School 3
- T&L 537 ELL Methods and Materials 3
- T&L 550 Assessment and Evaluation in ELL Education 3
- T&L 551 Second Language Acquisition for ELL Teachers 3
- T&L 580 Practicum in Schools 1-4
- EFR 506 Multicultural Education 3

**Instructional Design and Technology**

**IDT Certificate Programs**

IDT offers three 12-credit certificates. The certificates provide minimum competencies in the field of instructional design within a given subset of the field (technology integration, corporate training, or eLearning). Certificates are intended for those already working in some capacity as an instructional designer but who lack an advanced degree in instructional design. Those seeking the full set of professional competencies of an instructional designer across all areas in preparation for entering the field of instructional design are encouraged to apply to one of the IDT master’s programs instead. Courses taken for a certificate may also be transferred into any of the IDT master’s programs at a later date.

**IDT Certificate in K-12 Technology Integration**

**Required Courses**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

Select two of the following: 6
- IDT 510 Technology-Based Instruction: Applications and Methods
- IDT 540 Digital Media and the Internet in Schools
- IDT 545 Instructional Simulations and Games

Total Credits 12

**IDT Certificate in eLearning**

**Required Courses**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

Select two of the following: 6
- IDT 530 Introduction to Computer-Based Instruction
- IDT 545 Instructional Simulations and Games

Total Credits 12

**IDT Certificate in Corporate Training and Performance**

**Required Courses**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

Select two of the following: 6
- IDT 545 Instructional Simulations and Games
- IDT 560 Instructional Design Consulting
- IDT 570 Human Performance Technology

Total Credits 12

**Degree Delivery Options**

The IDT master’s and certificate programs are available for on-campus and distance delivery, making it possible to attain these degrees via distance delivery, on-campus attendance, or a combination of both. Online students and on-campus students are peers in the same class sessions and experience the same educational opportunities. Courses typically have a few synchronous (live) class sessions, where students may attend on-campus in the actual classroom or they may participate through our distance delivery system. In this manner, class lectures, discussion, presentation, and collaboration are done seamlessly, in a nearly identical fashion to traditional classes.

Asyncronous sessions (those done at the time and place of the students’ choosing each week) are handled through a course management system. Students use these tools to read material loaded by the teacher, turn in assignments, communicate through message boards, participate in discussions through threaded discussion tools, take tests, and receive their grades. There are assignments and participation activities every week, whether the class meets live or not. In this way, students get the best of both worlds: the flexibility of online learning and the personal contact and connection of face-to-face instruction.

**Cognate/Minor for Non-Program Majors**

The IDT program welcomes graduate students outside of IDT who want to learn more about the integration of technology with instruction. To complete a cognate or minor in IDT, students should take the following courses:
- IDT 500 Survey of Instructional Design 3
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

Total Credits 9

This will be considered by the IDT faculty to be a cognate or minor at the master’s level. If the student is a doctoral student and his or her department requires more credits for a minor, the IDT program chair will work with the student to select additional coursework to meet that minimum.

**EDL Courses**

**EDL 501. Leadership and Organizational Behavior. 3 Credits.**

This course provides school leaders with preparation in skills for providing purpose and direction for individuals and groups, shaping school culture and value, facilitating the development of shared strategic vision for the school, formulating goals and planning change efforts with staff, and setting priorities for one’s school in the context of community and district priorities for student and staff needs.

**EDL 502. Technology and Information Systems. 2 Credits.**

This course provides an understanding of selected computer applications for educational administrators. The focus of instruction is to have educational leaders use the computer as a decision-making and planning tool for carrying out communication functions of administration at the building and district levels.

**EDL 503. Seminar Educational Leadership. 1-4 Credits.**

Repeatable to 4 credits. Repeatable to 4 credits. S/U grading.
EDL 511. Effective Administrative Communications. 3 Credits.
This course prepares aspiring school leaders to plan for their personal and professional development; understand and use the principles of interpersonal, oral, and written communication.

EDL 512. Research, Measurement, and Program Evaluation. 3 Credits.
This course provides school leaders with an understanding of how to determine what diagnostic information is needed about students, staff, and the school environment; examine the extent to which outcomes meet or exceed defined standards, goals, or priorities for individuals or groups; draw inferences for program revisions; interpret and understand research, measurements, and evaluations; relate programs to desired outcomes; develop equivalent measures of incompetence; and design accountability mechanisms.

EDL 513. Leading Curriculum and Learning. 3 Credits.
This course provides school leaders the ability to understand major curriculum design models, interpret school district curricula, initiate needs analyses, plan and implement with staff for instruction, align curriculum with anticipated outcomes, monitor social and technological developments as they affect curriculum, and adjust content as needs and conditions change. Corequisite: EDL 535 or EDL 536 or EDL 537.

EDL 514. Supervision and Staff Development. 3 Credits.
This course provides school leaders with preparation in skills for instructional improvement, working with faculty and staff to identify professional needs. Classes are designed for in-depth study and practice planning, organizing, and facilitating programs that improve faculty and staff effectiveness and are consistent with institutional goals and needs; supervising individuals and groups; providing feedback on performance; arranging for remedial assistance; engaging faculty and others to plan and participate in recruitment and development activities; and initiating self-development.

EDL 515. Education Law and Ethics. 3 Credits.
This course is designed as a beginning law course for school administrators. In addition to the acquisition of legal knowledge as it relates to P-12 education, students are introduced to ethical perspectives that frequently influence the legal decision-making process.

EDL 516. Education Finance and Policy. 3 Credits.
Includes such topics as the organization of and responsibility for education in the United States at the federal, state, and local levels; basic administrative theories, processes, and techniques; and major areas of concern in the operation of local schools. The course includes an experiential learning assignment in which students complete a budget project.

EDL 517. Social, Cultural, Political, and Community Dimensions of Schools. 4 Credits.
This course provides school leaders with an understanding of the historical, philosophical, ethical, social, and economic influences affecting education to the degree that they can apply their understandings to professional decisions. Students are expected to apply political concepts and strategies and approaches to collaboration in involving the community in decision making, building community support for integrating health and social services in support of students, and developing community support for school priorities. Throughout the course, students' work will be expected to manifest a sensitivity to issues of diversity in a pluralistic society.

EDL 519. Principalship. 2 Credits.
This course provides school leaders with an understanding of the role of the building principal along with skills and techniques associated with the principalship. The topics include the principal's role in community and family relationships and collaboration, using community resources to support the academic and social needs of students and families, the development and application of policies related to students and staff, planning and delivering of curricular and cocurricular programs within the school, and the principal's role in working with staff. Students must also enroll in a one-credit field-based experience (EDL 520, 521 or 522) appropriate for their desired level of preparation for the principalship.

EDL 520. Middle School Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the middle school principal. Corequisite: EDL 519.

EDL 521. Elementary Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the elementary school principal. Corequisite: EDL 519.

EDL 522. Secondary Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the secondary school principal. Corequisite: EDL 519.

EDL 523. The Educational Plant. 3 Credits.
The purpose of this course is to provide a study of the planning, construction, modification, and maintenance of school buildings and complimentary facilities such as playgrounds, athletic fields and facilities, drop-off zones, and parking lots. This course will include appraisal of school facilities and techniques for developing and using input from the community and building and program audits.

EDL 524. Educational Personnel Administration. 2 Credits.
Study of selection, assignment, evaluation, development, and release practices for certified and non-certified school personnel; salary and contract administration in schools.

EDL 526. Business Management in Education. 2 Credits.
Study of the business function in educational organizations with emphasis on budget development and administration, accounting, purchasing, risk management, support services, and capital outlay.

EDL 527. Legal Issues in Education. 3 Credits.
Study of the legal issues affecting educational organizations with emphasis on state and federal relationships to local institutions, school boards and other governing bodies, contracts, teachers' and students' rights, and tort liability of educational organizations and their officers. Consideration is given to legal research and policy analysis.

EDL 528. Special Education Law. 3 Credits.
A course designed to give participants a working knowledge of the legislative, judicial, and administrative changes which have revamped the areas of teaching and administrating special education since 1974. It will provide information useful to administrators, practitioners, attorneys, parents, and advocates on topics including: student records, discipline, related services, due process, least restrictive environment, and appropriate education.

EDL 531. School District Leadership. 2 Credits.
A study of concerns and issues related to education leadership and administration at the district level, including relationships between the superintendent and the school board, community and school district staff.

EDL 532. Staff and Program Evaluation. 2 Credits.
A study of the evaluation of staff, including teachers, administrators, support personnel, and boards; and for purposes of accreditation, the evaluation of components that support the curriculum. Procedures, processes, and instruments will be identified and analyzed.

EDL 533. Collective Negotiations. 2 Credits.
A study of the collective bargaining process in the field of education. Includes topics such as contract language, planning for negotiations, bargaining strategies, impasse and arbitration, contract maintenance, grievance procedures, and results of the negotiations.

EDL 534. Administration of Elementary School Curriculum. 1-3 Credits.
Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A course of leadership skills for developing the administrator's understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of an elementary curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of elementary curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive K-5 grade level curriculum and its impact on learners. Corequisite: EDL 513.

EDL 536. Administration of Middle School Curriculum. 1-3 Credits.
Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A study of leadership skills for developing the administrator's understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of the middle school level curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of middle school level curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive 6-8 grade level curriculum and its impact on learners. Corequisite: EDL 513.
EDL 537. Administration of Secondary School Curriculum. 1-3 Credits. Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A study of leadership skills for developing the administrator's understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of secondary curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of middle school level curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive 9-12 grade level curriculum and its impact on learners. Corequisite: EDL 513.

EDL 538. Auxiliary School Functions. 3 Credits. Overview of school business and facilities management for educational administrators. Topics include: introduction to special area budgeting and accounting; insurance and risk management; forecasting; vendor relations; supervision of classified and support staff; management of support services, e.g., transportation, food service; facility operation and maintenance; and space utilization analysis, allocation; and cooperative community use of facilities.

EDL 571. School Community Relations. 2 Credits. Study of the responsibility of classroom, attendance unit, and district personnel in public information efforts; design, use, and analysis of surveys; study of involvement of parents and other community members in resource, advisory, and decision-making activities; preparation of news releases and public information materials; study of relationships to media personnel.

EDL 572. Educational Systems and Planning. 2 Credits. A study of the planning process including topics such as establishing goals; assessing needs; identifying resources; and generating, analyzing, and selecting alternatives. Processes and techniques in planning will be emphasized.

EDL 573. Administration and Organizational Behavior I. 3 Credits. A study and critique of selected theories and research in administration and organizational behavior including topics such as leadership; formal and informal structure; communication; change and intervention; motivation and morale; interpersonal relations and conflict management; small-group processes; and personality, values, and ethics.

EDL 574. Administration and Organizational Behavior II. 3 Credits. A continuation of Administration and Organizational Behavior I. Provides the student with the opportunity to design and carry out an original field study project in organizational behavior, participate in critiquing studies designed and completed by fellow students, and engage in individualized study in a topic area related to behavior in organizations.

EDL 575. Education and Public Policy. 3 Credits. A study of the development of policy issues, analysis of policy formation, implementation analysis, and structures and actors in policy activity.

EDL 579. Special Topics in Educational Leadership. 1-4 Credits. Exploration of special topics in the study of educational leadership not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

EDL 589. Superintendency Series. 1 Credit. Repeatable.

EDL 593. Internship in Educational Leadership. 1-8 Credits. This is a culminating experience primarily for Specialist Diploma and doctoral students. May be repeated. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of the advisor and instructor. Repeatable.

EDL 597. Readings in Educational Leadership. 1-4 Credits. Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisites: Consent of advisor and instructor. Repeatable.

EDL 599. Individual Research in Educational Leadership. 1-4 Credits. May be repeated. Prerequisites: Consent of advisor and instructor. Repeatable.


EDL 997. Independent Study. 1-4 Credits. Repeatable to 4 credits.

EDL 998. Thesis. 1-9 Credits.

EDL 999. Dissertation. 1-12 Credits. Repeatable to 12 credits.

EFR Courses

EFR 500. Introduction to the Foundations of Education. 3 Credits. A problem-centered class dialogue on those philosophical, social, political and historical concepts of educational thought that have shaped the development of the learning experience. F,S,SS.

EFR 501. Psychological Foundations of Education. 3 Credits. A study of the learning process with secondary emphasis on how the learning process is affected by individual differences, growth and development, and personality. A background in undergraduate Educational Psychology is assumed. Both theories of learning and theories of instruction are considered. Prerequisites: EFR 500 or consent of instructor.

EFR 502. Issues and Trends in Education. 3 Credits. Examination of contemporary issues of pre-K-12 and higher education and some of the philosophical, political, social, and historical foundations which influence their development. Students will engage in public scholarship through issue advocacy projects. Prerequisites: EFR 500 or consent of instructor. On demand.

EFR 503. Historical Foundations of Education. 3 Credits. An historical examination of the concepts of the meaning, nature, process, and purposes of education as evolved in different historical periods and social contexts with emphasis on the learners, ideas and changing institutions. Prerequisites: EFR 500 or consent of instructor.

EFR 504. Philosophical Foundations of Education. 3 Credits. A study of the representative schools of thought which have structured major philosophies of education. Prerequisites: EFR 500 or consent of instructor.

EFR 505. Sociological Foundations of Education. 3 Credits. The study of individuals, schools and education in their social contexts such as community, polity, equity, race, class, gender, and social reproduction. Focuses on the development of the field, its theories, and applications for educators. Prerequisites: EFR 500 or consent of instructor. On demand.

EFR 506. Multicultural Education. 3 Credits. A review of the conceptual, historical and theoretical aspects of multicultural education. A major goal will be to provide educators with processes for incorporating multicultural education into educational environments; to meet the needs of culturally diverse students and to increase the cultural awareness and sensitivity of all students. North Dakota/Native American issues are primary elements of this course. Prerequisites: EFR 500 or consent of instructor.

EFR 507. Gender, Sexuality and Education. 3 Credits. A critical feminist analysis of the history, philosophy, theory, curriculum, and practice of education. The roles of educators, students, society, biology, and policy are considered in the education of those of diverse sexes, genders and sexualities. Prerequisites: EFR 500 or consent of instructor.

EFR 508. Anthropological Foundations of Education. 3 Credits. Students will examine the convergence of anthropology and education through an analysis of education as cultural transmission and a review of enculturation and acculturation processes in traditional and modern societies. Prerequisites: EFR 500 or consent of instructor.

EFR 509. Introduction to Educational Research. 3 Credits. An introduction to the research methodologies used to study education. The course covers quantitative as well as qualitative types of research. The paradigms of both types of research will be contrasted and the application of the methodologies in actual research investigated.

EFR 510. Qualitative Research Methods. 3 Credits. Qualitative research methods are naturalistic and contextual. The methodology derives from Anthropology and other social sciences, and seeks to understand human behavior from the actors' perspective. Students are to learn the fundamental data collection methods: observation, participant observation, and interviewing, as well as data analysis through coding and categorizing.

EFR 511. Program Evaluation. 3 Credits. An interdisciplinary course which studies the theoretical models of program evaluation as well as professional standards. Emphasis is on the analysis of models for implementation and application in various social and public policy fields, as well as education. S.

EFR 512. Educational Tests and Measurements. 3 Credits. An introduction to psychological tests and measurements in educational settings and various research environments. The course covers basic concepts and principles in selection, construction, application, and evaluation of educational/psychological tests and measurements. Prerequisites: EFR 515 or consent of instructor. S.
EFR 513. Large Dataset Analysis. 3 Credits.
A study of educational and social science statistics involving manipulation and analysis of large national data sets using SPSS and/or SAS. Prerequisite or Corequisite: EFR 515 or consent of instructor. On demand.

EFR 514. Discourse Analysis. 3 Credits.
Discourse analysis is a research methodology used to analyze naturally occurring language use, whether in writing or in speech. It draws from and is practiced in many social science and humanities disciplines related to the foundations of education, including linguistics, sociology, anthropology, communications, and cognitive and social psychology. This course will provide students with the building blocks of performing discourse analysis, including instruction in its philosophical foundations, its practices, and its implications.

EFR 515. Statistics I. 3 Credits.
An introduction to basic statistical methods, focusing primarily on descriptive statistics and inferential statistics up to and including two-way analysis of variance.

EFR 516. Statistics II. 3 Credits.
An in-depth study of inferential statistics with primary emphasis on analysis of variance models, multiple regression techniques, analysis of covariance and other higher-order statistical procedures. Prerequisites: EFR 515 or consent of instructor. S/SS.

EFR 517. Advanced Research Methodologies. 3 Credits.
Both qualitative and quantitative aspects of research are considered for a variety of topics, including ethics in research, use of data banks, Q-methodology, survey research, Bayesian concepts, critical theory, longitudinal research and research consultation. Comprehensive examinations in educational research are addressed. This is a capstone course in educational research. Previous or concurrent involvement in research is highly desirable. Available for doctoral level students only.

EFR 518. Multivariate Analysis. 3 Credits.
Multiple regression in generalized problem solving; discriminant analysis, factor analysis, multivariate analysis, canonical analysis, and multivariate analysis of covariance. Students are encouraged to analyze their own data including student-generated computer applications.

EFR 519. Research Seminar. 1-4 Credits.
Experimental Design—An in-depth treatment of analysis of variance designs including factorial designs, treatment by subjects designs, groups within treatment designs, latin squares, higher dimensional designs, mixed effect designs, analysis of covariance, and trend analysis. Emphasis is placed on underlying linear models. Other seminars are held on specific research topics, particularly research proposals. May be repeated. Repeatable.

EFR 520. Advanced Qualitative Research Methods. 3 Credits.
Advanced Qualitative Research Methods will engage students in more in-depth and complex theoretical and practical issues associated with the methodology. Students will conduct mini-research studies and examine qualitative studies conducted by others. Knowledge about IRB requirements will also be addressed. Prerequisites: EFR 510 or consent of instructor.

EFR 522. Mixed-Methods Research. 3 Credits.
Mixed-methods research is the practice of combining quantitative and qualitative analysis within a single study. Students will learn the history and conceptual underpinnings of this methodological practice, read exemplary empirical studies that use mixed-methods, and explore the major mixed-methods designs. To apply these understandings, students will conduct a mixed-methods study on a topic of their own interests. Prerequisites: EFR 510 and EFR 516, or consent of instructor. S.

EFR 523. Structural Equation Modeling. 3 Credits.
This course builds from analyses underpinning structural equation modeling (SEM), such as reliability, exploratory factor analysis, and multiple regression, to SEM topics including path analysis, model specification and identification, goodness of fit, confirmatory factor analysis, structural models, mediation, multiple group invariance testing, and more. To apply these lessons, students will gain skills using SEM software. Prerequisite: EFR 516 or permission of the Instructor. On demand.

EFR 524. Needs Assessment. 3 Credits.
Needs assessment is a common evaluation method. This interdisciplinary course will study the concept of needs as well as the processes and techniques of conducting needs assessment. A set of techniques for implementation and application of needs assessment in various community, education, social work, public health, business/industry settings, government, and non-profit agencies will be reviewed. F.
HE 511. Program Development. 3 Credits.
This course will examine the learning theories that undergird the design and delivery of educational programs and services. Students will acquire the knowledge and skills needed to conduct needs assessments and outcomes assessments in-person and mediated environments. They will also learn and demonstrate program planning, development and implementation process. On demand.

HE 513. College Students and the Law. 3 Credits.
This course provides an overview of key legal issues that pertain to college students. Using a legal frame and analysis, the focus of the course surrounds administrative decision making, effective practices, and organizational policy design and implementation. On demand.

HE 529. Capstone Seminar. 1 Credit.

HE 530. Orientation to Doctoral Study. 1 Credit.
This course provides an orientation to doctoral study. S/U grading. On demand.

HE 532. Principles and Practices in Higher Education. 3 Credits.
This course is designed for students newly admitted to the doctoral program in higher education. It introduces students to the study of higher education enterprise in terms of its context, research, and practice. Among the topics covered, students in the course will explore the significance of institutional missions and purposes, federal and state governments, and the academic community. On demand.

HE 536. Leading and Learning in Higher Education. 3 Credits.
Colleges and universities are complex organizations with a core purpose of learning. An understanding of organizations, what they are and how they function is critical to success as a higher education professional. Further each member of the organization is called on to provide leadership for the organization in the classroom, the department, and other organizational units. Effective leaders will understand the organization and how their roles and work help support the institution's effectiveness in educating students. On demand.

HE 538. College Student Experiences. 3 Credits.
Given the growing awareness, economically, politically, and socially, of the need for students to succeed in college, faculty, staff, and administrators are increasingly being held accountable for college persistence and completion. A significant factor in students' success is their learning and development. Students in this course will explore concepts and theories related to student learning and development and be challenged to interpret and apply theories to real-world higher education practice, considering how these processes influence student success. On demand.

HE 549. Dissertation Orientation. 2 Credits.
This course introduces students to the dissertation process, focusing specifically on proposal formulation. S/U grading. On demand.

HE 561. Curriculum in Higher Education. 3 Credits.
A study of processes for planning, implementing, and evaluating curriculum within institutions of higher education. Topics will include historical perspectives on curriculum in higher education, governance systems related to curriculum development and adoption, and issues of current interest and concern. On demand.

HE 563. Academic Administration in Higher Education. 3 Credits.
The roles and responsibilities of academic administration in higher education. Topics include the major academic roles (chairperson, dean, chief academic officer), curriculum and instruction, program evaluation, assessment, planning, faculty workload and evaluation, and the profession of administrator. On demand.

HE 564. Higher Education Student and Support Services. 3 Credits.
An overview of the organization and functions of student and support services within institutions of higher education. Students will gain an understanding of the administrative issues related to career services, student counseling, enrollment services, student activities, health services, student organization, and other institutional units, which serve the needs of students at a college or university. On demand.

HE 569. Higher Education Diversity Systems and Policy. 3 Credits.
The course is designed to provide students with a critical understanding of issues of diversity in higher education from an institutional and systematic perspective. Multiple levels and dimensions of diversity will be discussed, including structural, institutional and systematic manifestations of how diversity and equity are historically and currently addressed. Institutional type and role will also be explored. On demand.

HE 570. Higher Education Law. 3 Credits.
An overview of the legal issues that confront college and university personnel. Pertinent federal and state statutes as well as case law will be used to instruct about legal rights and responsibilities of university/college administrators and students. The legal relationships between the institution and the faculty, the student, state government, and the federal government will be explored. On demand.

HE 573. Higher Education and Public Policy. 3 Credits.
The course addresses development, analysis, and implementation of public policy in postsecondary education and the structures and actors involved in policy activity. The course will also introduce students to current and ongoing postsecondary public policy issues at the state, national, and international levels. On demand.

HE 576. Higher Education Planning and Finance. 3 Credits.
Higher education must plan to ensure the future of the institution and those plans guide the allocation of resources to accomplish the institutional mission and plan. This course will provide an overview of planning processes and the subsequent allocation of resources to implement the plan. Students will also learn about financial management including budgeting, financial policies and performance metrics. The college administrator's role in guiding the fiscal welfare of an institution of higher education will be explored. On demand.

HE 579. Special Topics in Higher Education. 1-3 Credits.
Exploration of special topics in the study of education not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

HE 591. Practicum in Higher Education. 1-4 Credits.
Students will complete projects to further student learning through course design, teaching, and assessment. Repeatable up to a maximum of 8 credits. Prerequisite: Consent of advisor and instructor. Repeatable 8 credits. On demand.

HE 592. Internship in Higher Education. 1-8 Credits.
This is a professional practice experience in an administrative unit. May be repeated to a maximum of 8 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 8 credits. On demand.

HE 594. Readings in Higher Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics to a maximum of 9 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 9 credits. On demand.

HE 595. Higher Education Seminar. 1-9 Credits.
A seminar for advanced graduate students on a focused topic. Students will have significant responsibility for preparing and presenting papers and studies on the focus topic. May be repeated to a maximum of 9 credits. Prerequisites: Consent of the instructor and advisor. Repeatable to 9 credits. S/U grading. On demand.

HE 597. Administrative Project in Higher Education. 1-4 Credits.
For advanced graduate students. Students will undertake an assignment from an administrator for a project that will be implemented once it is completed. Repeatable to a maximum of 4 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 4 credits. On demand.

HE 598. Individual Research in Higher Education. 1-9 Credits.
Students design a research study, implement the research plan, and/or publish the results of the project. May be repeated to a maximum of 9 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 9 credits.

HE 995. Scholarly Project. 2 Credits.
Prerequisite: Consent of advisor. On demand.

HE 996. Continuing Enrollment. 1-12 Credits.
Repeatable to a maximum of 48 credits. Prerequisite: Consent of the advisor. Repeatable. S/U grading.

HE 997. Independent Study. 2 Credits.
Prerequisite: Consent of the advisor.

HE 998. Thesis. 1-9 Credits.
Prerequisite: Consent of the advisor. Repeatable to 9 credits.
SPED Courses

SPED 500. Education of the Visually Impaired. 3 Credits.
A course which provides an overview of the field of visual impairment to include the following areas of emphases: History/Philosophy; Service-delivery models; medical, psychological and educational implications of partial vision or total blindness; curricula methods and materials; current issues/trends.

SPED 501. Diseases and Function of the Eye. 2 Credits.
A course which introduces students to: a) the structural parts of the eye and its functions; b) common ocular conditions and diseases and their implications for education; c) interpretation of medical eye examination reports; and d) special considerations for infant, school-age academic, multiply disabled and adult populations.

SPED 502. Braille Reading and Writing. 2 Credits.
In this course students learn: 1) to read and write the literary code of grade 2 braille and 2) to teach the literary code of grade 2 braille to students of all ages.

SPED 503. Orientation and Mobility/Visually Impaired. 2 Credits.
This course introduces students to basic orientation and mobility techniques used by specialists when working with individuals with low vision and blindness. Concept development, kinesiology, tactile map construction, dog guides, electronic mobility devices and parental involvement are topics covered with respect to various populations (i.e. infants, schoolage academic children, multiply disabled children and adults).

SPED 504. Communication Media and Methods/Visually Impaired. 3 Credits.
This course provides an overview of the communication devices and adaptive technology used by the visually disabled. Students learn to read and write the braille codes for mathematics and music, do basic calculations on the abacus, brailer and talking calculator and gain familiarity with computers and software currently used in the field. Prerequisite: Consent of instructor.

SPED 505. Low Vision Assessment and Remediation. 2 Credits.
A course which focuses on children who have severe visual deficits but with proper training are able to utilize their vision for learning. Effects of low vision are studied with respect to psychological/sociological development, academic learning, skills of independent living, and vocational choice. Methods of assessing visual function are examined with emphasis on adaptions needed in the educational settings. Optical and non-optical aids are compared and evaluated. Prerequisite: T&L 315 or consent of instructor.

SPED 506. Introduction to Emotional Disorders. 3 Credits.
The historical perspective and the complexities of identification and characteristics of emotional disorders will be covered. Students will gain an understanding of service delivery models within a multisystems approach. F,S,SS.

SPED 507. Introduction to Intellectual Disabilities. 3 Credits.
The historical perspectives and the complexities of identification and characteristics of developmental/cognitive disabilities will be covered. Students will gain an understanding of service delivery models within a multi-systems approach. F,S,SS.

SPED 508. Introduction to Learning Disabilities. 3 Credits.
The historical perspective and the complexities of identification and characteristics of learning disabilities will be covered. Students will gain an understanding of service delivery models within a multisystems approach. F,S,SS.

SPED 509. IEP Development. 2 Credits.
This course is an introduction to the individualized education plan (IEP) process, including an understanding of how to develop and write effective IEPs for students with disabilities. In addition, the IEP template and process used by the state of North Dakota (i.e., TIENET) will be addressed.

SPED 510. Early Intervention for Children with Special Needs. 3 Credits.
An introduction to the field of Early Childhood Special Education, primarily for students interested in entering the field. Issues such as program design, parent involvement, identification, infant education, and effects of disabilities will be covered. F,S,SS.

SPED 511. Identification and Assessment of Young Children with Special Needs. 3 Credits.
A study of the principles and procedures for screening, identifying and evaluating young children with special needs. Emphasis will be placed on exposing students to available assessment instruments and providing opportunities for actual testing of preschoolers. Prerequisite: Admission to one of the master's programs in special education.

SPED 512. Methods and Materials for Preschool Children with Special Needs. 3 Credits.
A comprehensive study of curricula, program development and intervention strategies for disabled children ages birth to 6. Prerequisite: Admission to one of the master's programs in special education.

SPED 514. Intervention Strategies with Infants and Toddlers. 3 Credits.
This course provides for study into the unique needs of infants and toddlers with disabilities as well as the delivery of intervention services to the very young child with disabilities and his/her family. SS.

SPED 515. Professional Development. 1 Credit.
This course will provide an orientation to the roles and responsibilities of being a resident teacher in special education. Restricted to resident teachers in special education.

SPED 521. Transition to Adult Life. 3 Credits.
This course focuses on education, personal and vocational transition issues for students with disabilities across all grade levels into adult life. Assessment and transition program planning will be covered along with interagency collaboration skills and career awareness.

SPED 522. Introduction to Gifted/Talented Education. 3 Credits.
Historical and evolutionary research, theories, and philosophies for understanding the developmental and social-emotional needs of the more able child from early childhood through adolescence in educational experiences. Characteristics of G/T learners in the intellectual, leadership, academic, and creative realms; asynchrony; stereotypes; comorbidities; issues surrounding the identification of G/T learners. Cultural and societal influences on the field; educational trends. Prerequisite: T&L 315 or permission of the instructor.

SPED 523. Assessment in Gifted/Talented Education. 3 Credits.
Formal and informal assessments of characteristics of G/T learners in the intellectual, leadership, academic, and creative realms for identification and qualification for educational programming; assessment of readiness and content mastery. Ongoing assessment, progress monitoring, and data interpretation skills will be practiced. Issues surrounding the identification of G/T learners, including misdiagnosis, stereotyping, and bias will be critically evaluated. Legal issues surrounding this area, and cultural influences on data sources will be explored. Prerequisite: T&L 315, and T&L 423 or SPED 551, or permission of the instructor.

SPED 524. Teaching Methods in Gifted/Talented Education. 3 Credits.
Methodological and pedagogical approaches for fulfilling the unique academic, intellectual, creative, social, and emotional needs of the more able child in the educational environment. Exploration and analysis of contributing research, theories, and philosophies for designing differentiated learning opportunities from early childhood through adolescence via multiple modes (i.e. Bloom’s Taxonomy, Multiple Intelligence’s, technologies, multicultural and creative materials, etc.); educational trends through curriculum design and the integration of formal and informal assessment data and national/state standards to create individualized learning goals through curriculum compacting, tiering, acceleration, academic planning, modifications, and mentorships. Exploration and analysis of curriculum models to suit various learning needs of the asynchronous child with multiple forms of exceptionality (LD, ED, ASD, ELL); legal, cultural, and stereotype issues affecting the implementation of enriched curriculum for the G/T child with comorbidities. Prerequisite: SPED 522.

SPED 528. Advanced Assistive Technology. 1 Credit.
This course covers the types and functions of assistive technology for students with disabilities across a variety of settings, e.g., home, schools and community. Assistive technology assessment and a working knowledge of best practices of assistive technology in the lives of students will be addressed. Identification of funding sources and assistive technology resources will also be covered.
SPED 540. Concepts and Principles in Behavior Analysis. 3 Credits.
This course introduces definitions, characteristics, principles, processes, and concepts of Applied Behavior Analysis. In addition, the philosophical assumptions and dimensions of the science of applied behavior analysis, including determinism, empiricism, parsimony, selectionism, pragmatism, and lawfulness of behavior will be addressed. Students will learn to differentiate between environmental and mentalistic explanations of behavior, and between conceptual, experimental, and applied analyses of behavior. F,S,SS.

SPED 541. Methods and Applications in Behavior Analysis. 3 Credits.
This course addresses behaviorally-based strategies to establish, strengthen, and weaken target behaviors. Fundamental elements of behavior change are reviewed, with a focus on selecting evidence-based tactics that utilize basic principles of behavior (reinforcement, punishment, extinction, and stimulus control), as well as utilizing appropriate parameters and schedules of reinforcement and punishment. Various procedures combining fundamental behavior principles are reviewed, modeled, practiced, and demonstrated to mastery and fluency. F,S,SS.

SPED 542. Ethical and Professional Conduct for Behavior Analysts. 3 Credits.
This course introduces ethical and professional considerations relevant in the professional practice of applied behavior analysis as well as the ethical and disciplinary standards of the profession. Students will become familiar with the ethical and professional conduct and legal issues relevant to Board Certified Behavior Analyst-level practitioners found in the Behavior Analyst Certification Board's Guidelines for Responsible Conduct for Behavior Analysts and Disciplinary and Ethical Standards and Disciplinary Procedures (2012), as well as the professional conduct consistent with the practice of applied behavior analysis. F,S,SS.

SPED 543. Applied Behavior Analysis Across Settings and Populations. 2 Credits.
This course will focus on client-centered responsibilities across settings, including identification of the problem and selection and implementation of interventions based on biological, medical, and environmental variables. The course will also address management of behavioral services and supervision of those responsible for carrying out behavior change procedures. F,S,SS.

SPED 544. Research Methods in Behavior Analysis. 3 Credits.
This course focuses on the measurement of behavior and the analysis of intervention effect using single-subject experimental design. Procedures for collection and display of behavioral data are demonstrated, practiced, and examined for reliability, validity, efficiency, and relevance to a variety of settings, with a focus on educational environments. Individualized measurement procedures are developed and implemented using a variety of single-subject design formats, and the contribution of single-subject research design to education, clinical practice, and scientific inquiry is examined. Ethical considerations of experimental analysis are examined. F,S,SS.

SPED 545. Assessment and Behavior Change Systems. 4 Credits.
This course will address the process of identifying behaviors targeted for change and the use of behavioral assessment techniques to identify and analyze behavior-environment relations for the purpose of developing successful, functionally-based intervention strategies. Students will learn a variety of methods for behavior assessment, interventions, analysis of interventions, experimental analysis, and interpreting outcomes including the use of practical behaviorally-based assessment tools such as checklists, rating scales, structured observation tools, and curricular assessments. F,S,SS.

SPED 551. Advanced Assessment/Special Needs Students. 3 Credits.
Theory and practice of assessment, including formal and informal procedures for screening, identification and assessment of students with disabilities. Practical assignment included. Prerequisite: Admission to one of the master's programs in special education. F,S,SS.

SPED 552. Inclusive Methods. 3 Credits.
The study of a variety of methods and materials for teaching and assessing children and youth with learning and behavior problems in the general education classroom. F,S,SS.

SPED 554. Advanced Methods: Learning Disabilities. 3 Credits.
The study of specific strategies, methods, and materials for working with students with learning disabilities. Prerequisite: Admission to one of the master's programs in special education.

SPED 555. Advanced Methods: Emotionally Disturbed. 3 Credits.
The study of specific strategies, methods, and materials for working with students with emotional/behavioral disorders. Prerequisite: Admission to one of the master's programs in special education.

SPED 556. Advanced Methods: Intellectual Disabilities. 3 Credits.
This course is a masters level methods course designed for professionals seeking to extend their skills in the areas of instruction, functional (life skills) curriculum, program and curriculum development, and functional behavioral analysis for working with students with moderate to severe intellectual disabilities. Prerequisites: Graduate status and admission to one of the master's programs in special education. F,S,SS.

SPED 557. Progress Monitoring/Special Needs Students. 3 Credits.
This course covers all aspects of progress monitoring including what it is, how it works, the benefits of progress monitoring, various ways and strategies for conducting progress monitoring and how it functions in a Response to Intervention (RTI) model. Students will learn how to track students in reading, math, and written language by collecting data and then using that data to measure student progress and in instructional decision-making. The strongest research-based strategy for progress monitoring, curriculum-based measurement, will be covered in depth. Prerequisite: Admission to one of the master's programs in special education. F,S,SS.

SPED 558. Response to Intervention. 2 Credits.
This course will address common elements of Response to Intervention (RTI) including definition, components of successful RTI models, establishing RTI teams and building capacity for school-wide RTI implementation, the use of standard protocol in RTI implementation, monitoring progress in academics and behavior within RTI models, understanding guidelines for problem-solving/decision making in RTI, as well as the future direction of RTI. F,SS.

SPED 560. Introduction to Autistic Spectrum Disorder. 3 Credits.
This is the introductory course in a sequence of interdisciplinary courses focusing on autistic spectrum disorder. Its central purpose is to encourage parents and caregivers of individuals with autistic spectrum disorder to engage in reflective thinking about and critical analysis of the many and varied issues, e.g., identification, educational placement, effective treatments, vocational training, related to the provision of quality lifelong supports for these individuals. Prerequisites: Completed degree from a related field of study, or seniors who have completed T&L 315, and are completing an undergrad degree from a related field of study (see dept for approval). F,S,SS.

SPED 561. Methods for Autistic Spectrum Disorder. 3 Credits.
This is a required course in a sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to address commonly implemented intervention strategies, particularly those considered to be evidence based or research supported in the field of ASD. This course examines the current literature base supporting various interventions and strategies with a focus on matching the needs and strengths of individuals with ASD to the most appropriate intervention method based on data driven practice and research support for a particular intervention. Prerequisite or corequisite: SPED 560. F,S,SS.

SPED 562. Autistic Spectrum Disorder: Supports Across the Lifespan. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Issues related to parental reactions to diagnosis, stressors at home and school, strategies for empowering families, transitional situations for individuals with ASD, transitions to jobs and college, and legal issues will be explored. The central purpose of the course is threefold: a) to provide current information related to the chronic stressors experienced by caregivers for and family members of persons with ASD, b) to provide current information regarding career/vocational options related to transition from high school through adult life, e.g., young adults, middle-aged adults, older adults, and c) to provide current information regarding legal issues related to the provision of lifelong supports for persons with ASD. Prerequisite: Completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. F,S.

SPED 563. Autistic Spectrum Disorder: Medical Issues and Trends. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autism spectrum disorders (ASD). The purpose of this course is to examine the historical perspective and complexities of the role of medicine and medically oriented interventions for individuals with ASD. Issues will be explored related to conducting wellness examinations, current and future medications/treatments, genetics, collaboration, and resources. Prerequisite: A completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. F,S.
SPED 564. Structured Teaching. 3 Credits.
This is an elective course in the sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to encourage parents and caregivers of individuals with ASD to engage in reflective thinking about and critical analysis of this educational approach for these persons. Prerequisites or corequisites: SPED 560 and SPED 561. F.

SPED 565. Methods for Students with Asperger Syndrome. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autistic spectrum disorders (ASD), specifically focusing on those individuals with diagnoses or high functioning autism, Aspergers, and ASD with lower levels of support needed. The purpose of this course is to equip individuals interacting and working with people with high functioning ASD the pertinent background knowledge and experience with the diagnosis and characteristics to effectively implement assessments, functional analysis, various methods and practices, and transition planning to support individuals with ASD and their families. Prerequisite: A completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. SS.

SPED 566. Autistic Spectrum Disorder Intensive Early Intervention. 3 Credits.
This is an elective course in the sequence of interdisciplinary courses focusing on children with autistic spectrum disorder (ASD) birth to age six. Topics addressed will include basic characteristics of children with ASD birth to age six, the developmental implications for these children and their families, and research-supported early interventions utilizing a family-centered approach with an emphasis on natural learning opportunities. Prerequisite: A completed degree from a related field of study. F, SS.

SPED 567. ASD Assessment. 3 Credits.
This course is a required course in a sequence of interdisciplinary courses focusing on autistic spectrum disorders (ASD). This course will address the entire process of program planning for students with ASD including screening, evaluative assessment, ongoing assessment, using assessment to guide intervention planning, and monitoring progress. Students will explore a variety of methods and tools commonly used with individuals with ASD; specifically standardized assessments, checklists, rating scales, structured observation tools, and curricular based assessments. Its central focus is on assessing the ongoing needs and strengths of individuals with ASD in order to plan successful interventions in further differentiating instruction. Prerequisite: SPED 560. Corequisite: SPED 561. F, SS.

SPED 578. Behavior Management for Special Needs Students. 3 Credits.
The study of a variety of effective behavior management and assessment techniques appropriate to the needs of children and youth with special needs. Topics include procedures to increase self-awareness, self-management, self-control, self-esteem, and assessment procedures and techniques for determining behavioral needs. Prerequisite: Admission to one of the master's programs in special education.

SPED 580. Practicum: Special Education. 1-6 Credits.
Practicum in the study of children and adolescents with disabilities in school and related settings. May be repeated to 8 credits. Repeatable to 8 credits. F, SS.

SPED 583. Internship: Autism Spectrum Disorders. 1-6 Credits.
This is a culminating experience for students in the area of autism spectrum disorders. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 560, SPED 561, and consent of the instructor. Repeatable to 6 credits.

SPED 584. Internship: Gifted/Talented. 1-6 Credits.
This is a culminating experience for students in the area of gifted/talented. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Repeatable to 6 credits. Repeatable up to 6 credits maximum. Prerequisites: SPED 522, SPED 523, and SPED 524, or consent of the instructor. Repeatable to 6 credits.

SPED 585. Internship: Visual Impairment. 1-6 Credits.
This is a culminating experience for students who are seeking licensure or an endorsement in the area of visual impairment. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Repeatable to 6 credits maximum. Prerequisites: SPED 500, SPED 501, SPED 502, and consent of the instructor. Repeatable to 6 credits. F, SS.

SPED 586. Internship: Emotional Disturbance. 1-6 Credits.
This is a culminating experience for students in the area of emotional disturbance. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 587. Internship: Intellectual Disabilities. 1-6 Credits.
This is a culminating experience for students in the area of Intellectual disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits. F, SS.

SPED 588. Internship: Learning Disabilities. 1-6 Credits.
This is a culminating experience for students in the area of learning disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 589. Internship: Early Childhood Special Education. 1-4 Credits.
This is a culminating experience for students who are seeking licensure or an endorsement in the area of early childhood special education. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 510, SPED 511 and SPED 512, and consent of the instructor. Repeatable to 4 credits.

SPED 590. Special Topics in Special Education. 1-4 Credits.
Exploration of special topics in the study of special education. May be repeated for different topics. Repeatable to 30 credits.

SPED 591. Readings: Special Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics. Repeatable. F, SS.

SPED 593. Independent Project: Special Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisites: Consent of advisor and Instructor. Repeatable.

SPED 995. Scholarly Project. 2 Credits.
The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner that is directly related to their roles as teachers, program evaluators, and action researchers. The scholarly project must be approved by the student’s advisor. F, SS.

SPED 997. Independent Study Report. 2 Credits.
Independent study and preparation of a written report for students taking the non-thesis option in the Master’s program. F, SS.

TL Courses

T&L 513. Linguistics for ELL Teachers. 3 Credits.
This course introduces the complexities of human language through the study of phonetics, phonology, morphology, syntax and semantics. Additional topics addressed include the brain and language, history of the English language, psycholinguistics, writing systems and language in social contexts. F, SS.

T&L 514. Introduction to Multilingual Education. 3 Credits.
This course explores language education models, programs and policies with an emphasis on English language learners (ELLs). Political, legal, historical, and cultural contexts of multilingual education will be discussed with a focus on both U.S. and global challenges.

T&L 515. Middle School Curriculum. 3 Credits.
This course examines the middle school curriculum and instructional strategies as well as the needs of early adolescents. The course focuses on the roles teachers play in incorporating a guided, interdisciplinary, collaborative team approach. The studies include the components of curriculum planning, advisory, exploration, learning communities and instruction (differentiation, cooperative learning, learning styles, instructional strategies) incorporated in middle schools.
T&L 516. Philosophy and Foundations of Middle School Education. 3 Credits.
This course examines the historical and philosophical background of middle level education. The focus is on the roles teachers/administrators play in incorporating this guided, interdisciplinary, collaborative team approach that assists students during these fundamentally transformative years. The course looks at the philosophical aspect of the curriculum and instructional component. The studies explore contemporary issues associated with the middle school as well as the adaptations necessary for special circumstances affiliated with middle schools.

T&L 518. Science in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing inquiry-based science in elementary classrooms.

T&L 519. Social Studies in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing social studies in elementary classrooms.

T&L 520. Curriculum and Instruction in the Elementary School. 4 Credits.
A study of processes for planning, implementing, and evaluating curriculum and improving instruction in elementary schools.

T&L 521. Differentiated Instruction. 3 Credits.
An introduction to the principles of differentiated instruction. Topics of study include: brain-based learning, responsive instructional and assessment strategies, linking curriculum standards to learner needs, organizing and managing a differentiated classroom, and relevant resources for implementation.

T&L 522. Mathematics in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing inquiry-based math in elementary classrooms.

T&L 523. Literacy Instruction for English Language Learners. 3 Credits.
This course addresses the foundations of teaching English language and literacy to English Language Learners (ELLs) and includes study of various approaches to ELL/bilingual education, methods of instruction, assessment of English language proficiency, and strategies to make content learning comprehensible for ELLs. Emphasis will be placed on praxis and current research in the field.

T&L 524. Reading in the Content Areas. 2 Credits.
How and why reading should be taught in the content areas (i.e. Social Studies, Science, Mathematics, etc.). Research studies in the field of content reading and a variety of instructional practices are reviewed.

T&L 525. Writing in the Classroom. 3 Credits.
This course examines writing as a process that is developmental, cultural, social, and individual. Emphasis is on effective implementation of the essential structures of writing workshop and on monitoring and assessing writers' growth.

T&L 526. Play in Development and Early Childhood Education. 3 Credits.
This course explores the role of play in cognitive, physical and social-emotional development, and the way in which play is incorporated into educational and other programmatic settings. Students will explore how assessment of play indicates a child's development, and they will use assessment to promote Developmentally Appropriate Practices (DAP) for PreK-Grade 3 (ages 3-8) learners.

T&L 527. Curricular Foundations in Early Childhood Education. 3 Credits.
This course examines the historical, philosophical, cultural, race, class, and gender influences on curriculum in early childhood, including the philosophy and mission of the Department of Teaching and Learning.

T&L 528. Children's Literature in the Classroom. 3 Credits.
This course is a study of children's literature and literary criticism which serves as the foundation for examining teaching methods that develop children's engagement with literature and promote reading achievement.

T&L 529. Language Development & Cognition in Children. 3 Credits.
This course provides foundational information about language and cognitive development in children. The course content will also analyze typical and atypical language and cognitive development. The focus of the course will include children birth to age eight.

T&L 530. Foundations of Reading Instruction. 3-4 Credits.
This course focuses on the relationship between reading theory, research, contemporary issues and instructional practice. Emphasis is placed on strategic systems related to effective reading, instructional approaches that support the development of these strategic systems and assessment as collecting evidence of effective reading behaviors.

T&L 531. Early Literacy Development and Instruction. 3 Credits.
A study of early literacy processes including phonemic and print awareness, word recognition, comprehension, and writing. Emphasis is on reviewing current research and theory, assessment and instruction practices, and bridging language and literacy development in literacy rich environments.

T&L 532. Leadership in Literacy. 3 Credits.
The role of the literacy coach is to support teachers in closing the gap between learners’ performance and achievement in reading and writing. Topics in this course will include providing leadership for a school’s literacy program, collaboration with teachers and administrators, curriculum issues, knowledge of literacy standards, and professional development facilitation. On demand.

T&L 533. Reading in the Secondary School. 2 Credits.
Development of reading-study skills in the content subject areas and reading strategy development.

T&L 534. Basic Reading Diagnosis and Remediation. 2 Credits.
Focuses on common causes of reading disability, methods of diagnosis, and corrective reading programs in the classroom. Corequisite: T&L 583.

T&L 535. Advanced Reading/Language Arts Diagnosis and Remediation. 2 Credits.
Analysis of interrelationships of learning difficulties in language arts areas and procedures for remediation. Prerequisites: T&L 530 and T&L 534.

T&L 536. Teaching Language Arts. 3 Credits.
Considers the objectives of language arts programs, methods of instruction, and recent curricular trends. Recent research is read and critiqued. On demand.

T&L 537. ELL Methods and Materials. 3 Credits.
This course explores current methods and materials in ELL education, with a focus on teaching academic language and sheltered content instruction. F,S,SS.

T&L 538. Supervision of Student Teaching. 2 Credits.
For supervisors and directors of student teaching in colleges and cooperating schools. Principles and practices on how to provide the most beneficial experiences for student teachers.

T&L 539. College Teaching. 3 Credits.
Explores learning styles and teaching styles, the components and responsibilities involved in college teaching, methods of teaching and motivating students, and current issues related to instruction in the college classroom.

T&L 540. Theory and Philosophies of Curriculum in Schools. 3 Credits.
This course explores the historical development of the K-12 curriculum, the philosophical and theoretical aspects applied to curriculum, and the social conditions that impact curriculum.

T&L 541. History of Higher Education in the United States. 3 Credits.
Study of major events and people shaping higher education in the U.S. Role, philosophy, and organization of institutions of higher education discussed.

T&L 542. Models of Teaching. 3 Credits.
This course focuses on various models of teaching: social interaction, information-processing, inquiry and behavioral. The purpose of the course is to provide teachers with a variety of instructional models related to meaningful learning experiences for students.

T&L 543. Scholarly Writing. 3 Credits.
Designed to assist students with learning the art of scholarly writing, this course will aid students in designing, formatting, and completing research-based and other scholarly writing projects, as well as understanding the rules and norms of academic publishing.

T&L 544. Assessment in Higher Education. 3 Credits.
A wide range of assessment issues in higher education will be explored. This includes course, program, and institutional assessment as well as classroom assessment techniques. Students will examine and understand the assessment process.

T&L 545. Adult Learners. 3 Credits.
This course will cover theories of adult development, current research on adult learners, ways of assessing the needs and interests of adult learners, and ways of creating environments in which adult learners can thrive.
T&L 546. College Students with Special Needs. 3 Credits.
This course explores the range of special needs college students bring to campus and how faculty, staff, and administrators might appropriately meet those needs. Prerequisite: Admission to the School of Graduate Studies or instructor permission. S.

T&L 547. Technology in Higher Education. 3 Credits.
Students will examine the various uses and integration of technology and media in higher education by faculty in their attempt to engage learners with each other, the course content, and with instructors.

T&L 548. The Professoriate. 3 Credits.
This course is a study of the development of the American professoriate by way of historical, scholarly, popular, and contemporary perspectives. It also examines the transition of new faculty members to their initial academic appointment.

T&L 549. Seminar. 1-4 Credits.
The seminar will focus on a specific topic relating to teaching and learning. The specific content will vary depending upon student needs and faculty resources. Repeatable. S/U grading.

T&L 550. Assessment and Evaluation in ELL Education. 3 Credits.
This course combines readings and theoretical discussion of assessment with hands-on experience in assessing ELLs. Students will learn how to use a variety of formal and informal assessments with a focus on how to use assessment data in planning instruction. Topics will include classroom-based assessments, language proficiency testing, testing accommodations for ELLs, and assessment of ELLs for special education and gifted education, and ELL program evaluation.

T&L 551. Second Language Acquisition for ELL Teachers. 3 Credits.
This course will explore the socio- and psycho-linguistic aspects of interlanguage by studying the theories and research of first and second language acquisition. Students will examine the nature of learners and their individual differences during the stages of language development, with a focus on children and K-12 classrooms.

T&L 553. Collaborative Relationships: Home, School and Community. 3 Credits.
A course appropriate for anyone working with families, early childhood educators, general educators, special educators, related service personnel, administrators and outside agency personnel. Topics covered include: (1) the various models of collaboration and consultation and the stages of each; (2) communication skills; (3) problem-solving; (4) conflict management; (5) diverse perspectives; (6) information collection procedures; (7) supervisory skills; (8) family characteristics and structure across the lifespan; (9) family focused intervention; (10) school choices; and (11) school issues such as poverty, domestic violence, teasing, bullying, and school violence.

T&L 558. Middle School Science and Engineering Lab1:Solids. 2 Credits.

T&L 559A. MS Sci.Eng-2: Solids. 3 Credits.
Prerequisites: T&L 558, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 559B. MS Sci.Eng: Solids. 3 Credits.
Prerequisites: T&L 558, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 566. Brain in Memory and Learning. 3 Credits.
Prerequisite: Admissions to Grad School.

T&L 567. Language Structure and Analysis for ELL Teachers. 3 Credits.
This course explores the grammatical and discourse structures of the modern English language, analysis of grammar and discourse with a focus on specific problem areas for ELLs, and pedagogical implications for English language development.

T&L 568. Research and Advocacy in TESOL. 3 Credits.
This course prepares teachers to both understand and conduct research in TESOL. Emphasis will be placed on using research data to advocate for changes and improvement in ELL education.

T&L 569. Action Research. 3 Credits.
The study of the philosophy and methods of action research. Emphasis is focused on analysis of and reflection on one's teaching for the purpose of improvements in student learning. Prerequisite: Graduate status. S.

T&L 570. Teacher Education. 3 Credits.
Practices, issues, and trends in the design and implementation and assessment of programs for the preparation and development of K-12 teachers.

T&L 572. Teacher Education: Focus on the Learner. 3 Credits.
The study of teacher education in relation to the lives of P-12 students. This course includes the examination of children and their lives through aspects of race, religion, socioeconomics, linguistics and age, and considers educational implications for preservice and inservice teachers.

T&L 573. Middle School Science and Engineering Lab2: liq/Gas. 2 Credits.

T&L 574. MS Sci.Eng-4: Liquid/Gas. 3 Credits.
Prerequisites: T&L 573, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 575. Middle School Science and Engineering Lab3: Mot/Elec. 2 Credits.

T&L 576A. MS Sci.Eng.-6: Motion/Electric. 3 Credits.
Prerequisites: T&L 575, admission to Graduate School, ND Teacher Licensure and employment as a teacher in a ND school.

T&L 576B. MS Sci.Eng.-6: Motion/Electric. 3 Credits.
Prerequisite: T&L 576A.

T&L 577. Assessment of Learning. 3 Credits.
This course addresses the theory and practice of assessment, specifically the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of educational experiences.

T&L 579. Classroom Based Inquiry, 3 Credits.
Concepts learned in T&L 569 will be looked at in-depth and theoretical constructs such as Living Theory, Self Study, and Critical Theory constructs will be studied. Students plan and conduct an in-depth inquiry project within a school setting. complete the associated IRBs, and create and academic poster and/or prepare a proposal of the Inquiry project for a professional setting.
Prerequisites: TL graduate status and T&L 569; or by permission of instructor. F.S.

T&L 580. Practicum in Schools. 1-4 Credits.
Practicum in study of desirable school practices, observations in nearby schools, and application of research findings in solving practical problems.
Prerequisites: Appropriate foundational and major area courses, and consent of the instructor and advisor. Repeatable.

T&L 581. Resident Internship. 4 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program.
Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

T&L 582. Resident Internship. 4 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program.
Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

T&L 583. Reading Clinic. 2 Credits.

T&L 584. Internship in Education. 1-8 Credits.
This is a culminating experience primarily for Sixth year and Doctoral students. The internships will be identified in one of the following sub-areas: (A) Educational Administration, (B) Special Education, (C) Curriculum, (D) Educational Research, or (E) Teacher Education. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of advisor and instructor. Repeatable.

T&L 589. Professional Development: Resident Teacher Program. 2 Credits.
This field-based experience provides mentoring and coaching, translates baccalaureate theory and research into practice, and requires active participation in the school placement and classroom setting. Issues and topics relevant to first year teachers and graduate education are emphasized through field work and discussions. Prerequisite: Admission into the Elementary Education Resident Teacher Program. SS.
Textual content
Foundations 1  6
Research Methods 2  6
Curriculum, Instruction, and Leadership (HE, EDL or T&L)  3
Cognate or Minor  9
EFR 997 Independent Study M Ed & M S  2-4
or EFR 995 Scholarly Project
or EFR 998 Thesis

Total Credits  32-34

1 EFR 500 is a prerequisite for all further foundations courses (EFR 501-508, EFR 525).
2 EFR 509 is a prerequisite for all further research methods courses (EFR 510-524).

Required for all students, regardless of thesis or non-thesis:
1. A minimum of 32 credits, including both credits required for the major and credits for the independent study, scholarly project or thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. The program may include the major and a non-EFR minor (a single discipline) or the major and a non-EFR cognate area (an interdisciplinary group of courses).

Thesis Option:
1. Four credits for the Thesis (EFR 998)
2. Preparation of a written thesis is approved by a committee of three faculty. The student's advisor chairs the committee.
3. Presentation and defense of the thesis takes place before the final report is sent to the School of Graduate Studies.

Independent Study/Scholarly Project Option:
1. Two credits for the Independent Study (EFR 997) or Scholarly Project (EFR 995).
2. Pass a written final comprehensive examination covering the major field and, at the advisor's discretion, any secondary fields.
3. Preparation of a written independent study or scholarly project must be approved by the faculty advisor.
4. Presentation of independent study or scholarly project takes place before the final report is sent to the School of Graduate Studies.

Doctor of Philosophy (Ph.D.)

Admission Requirements
Students with a master's degree in a field unrelated to Education are eligible for admission to the Ph.D. program.

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

Important dates:
For admission in the Fall semester, please send your complete application materials by February 15; you will be advised of our decision by April 15. For admission in the Spring semester, please send your application materials by October 1; you will be advised of our decision by December 1.

International students should be aware that the School of Graduate Studies at the University of North Dakota does not recognize master's degrees from institutions outside of the United States or Canada. Students must satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

Application materials should include:

1. Transcripts showing a bachelor's degree from an accredited college or university
2. Transcripts showing a graduate degree from an accredited college or university
3. Graduate GPA of 3.5 and above
4. Three letters of reference
5. An essay that responds to questions provided in the application
6. A resume and a writing sample of 10-15 pages (separate from #5 above). Your writing sample should demonstrate the best of your intellectual abilities and/or creative work.
7. Optional: scores from the GRE exam, the Advanced GRE, or the Miller's Analogy Test.

Degree Requirements
Students seeking the Doctor of Philosophy degree must satisfy all general requirements set forth by the School of Graduate Studies for the Ph.D., as well as the following:

1. A minimum of 90 credit hours beyond the bachelor's degree
2. With approval of a student's Faculty Advisory Committee, 30 credits from a master's degree from an accredited institution will be applied to the doctoral program of study
3. Maintenance of a minimum of 3.0 GPA
4. Educational Foundations credit hours of 21 or 9 (depending on the emphasis)
5. Research Methodologies credit hours of 21 or 12 (depending on the emphasis)
6. A cognate of 12-15 credits (depending on emphasis)
7. A dissertation of 15 credits
8. The following course requirements:

Foundations of Education Emphasis
Select seven of the following: 21

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<tr>
<th>Course</th>
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<td>EFR 501</td>
<td>Psychological Foundations of Education</td>
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<td>EFR 502</td>
<td>Issues and Trends in Education</td>
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<td>EFR 503</td>
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<td>EFR 506</td>
<td>Multicultural Education</td>
</tr>
<tr>
<td>EFR 507</td>
<td>Gender, Sexuality and Education</td>
</tr>
<tr>
<td>EFR 508</td>
<td>Anthropological Foundations of Education</td>
</tr>
<tr>
<td>EFR 525</td>
<td>International and Comparative Education</td>
</tr>
<tr>
<td>EFR 591</td>
<td>Readings in Education (With advisor approval)</td>
</tr>
</tbody>
</table>

Select four of the following (Research): 12

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 510</td>
<td>Qualitative Research Methods</td>
</tr>
<tr>
<td>EFR 511</td>
<td>Program Evaluation</td>
</tr>
<tr>
<td>EFR 512</td>
<td>Educational Tests and Measurements</td>
</tr>
<tr>
<td>EFR 513</td>
<td>Large Dataset Analysis</td>
</tr>
<tr>
<td>EFR 514</td>
<td>Discourse Analysis</td>
</tr>
<tr>
<td>EFR 516</td>
<td>Statistics II</td>
</tr>
<tr>
<td>EFR 517</td>
<td>Advanced Research Methodologies</td>
</tr>
<tr>
<td>EFR 518</td>
<td>Multivariate Analysis</td>
</tr>
<tr>
<td>EFR 520</td>
<td>Advanced Qualitative Research Methods</td>
</tr>
<tr>
<td>EFR 522</td>
<td>Mixed-Methods Research</td>
</tr>
<tr>
<td>EFR 523</td>
<td>Structural Equation Modeling</td>
</tr>
<tr>
<td>EFR 524</td>
<td>Needs Assessment</td>
</tr>
<tr>
<td>EFR 590</td>
<td>Special Topics in Education</td>
</tr>
<tr>
<td>EFR 592</td>
<td>Individual Research in Education (With advisor approval)</td>
</tr>
<tr>
<td>HIST 501</td>
<td>Methods of Historical Research</td>
</tr>
</tbody>
</table>

Total Credits  33

Research Methodologies Emphasis
Select seven of the following: 21
EFR 500. Introduction to the Foundations of Education. 3 Credits.
A problem-centered class dialogue on those philosophical, social, political and historical concepts of educational thought that have shaped the development of the learning experience. F, S, SS.

EFR 501. Psychological Foundations of Education. 3 Credits.
A study of the learning process with secondary emphasis on how the learning process is affected by individual differences, growth and development, and personality. A background in undergraduate Educational Psychology is assumed. Both theories of learning and theories of instruction are considered. Prerequisites: EFR 500 or consent of instructor.

EFR 502. Issues and Trends in Education. 3 Credits.
Examination of contemporary issues of pre-K-12 and higher education and of the philosophical, political, social, and historical foundations which influence their development. Students will engage in public scholarship through issue advocacy projects. Prerequisites: EFR 500 or consent of instructor. On demand.

EFR 503. Historical Foundations of Education. 3 Credits.
An historical examination of the concepts of the meaning, nature, process, and purposes of education as evolved in different historical periods and social contexts with emphasis on the learners, ideas and changing institutions. Prerequisites: EFR 500 or consent of instructor.

EFR 504. Philosophical Foundations of Education. 3 Credits.
A study of the representative schools of thought which have structured major philosophies of education. Prerequisites: EFR 500 or consent of instructor.

EFR 505. Sociological Foundations of Education. 3 Credits.
The study of individuals, schools and education in their social contexts such as community, polity, equity, race, class, gender, and social reproduction. Focuses on the development of the field, its theories, and applications for educators. Prerequisites: EFR 500 or consent of instructor. On demand.

EFR 506. Multicultural Education. 3 Credits.
A review of the conceptual, historical and theoretical aspects of multicultural education. A major goal will be to provide educators with processes for incorporating multicultural education into educational environments; to meet the needs of culturally diverse students and to increase the cultural awareness and sensitivity of all students. North Dakota/Native American issues are primary elements of this course. Prerequisites: EFR 500 or consent of instructor.

EFR 507. Gender, Sexuality and Education. 3 Credits.
A critical feminist analysis of the history, philosophy, theory, curriculum, and practice of education. The roles of educators, students, society, biology, and policy are considered in the education of those of diverse sexes, genders and sexualities. Prerequisites: EFR 500 or consent of instructor. On demand.

EFR 508. Anthropological Foundations of Education. 3 Credits.
Students will examine the convergence of anthropology and education through an analysis of education as cultural transmission and a review of enculturation and acculturation processes in traditional and modern societies. Prerequisites: EFR 500 or consent of instructor.

EFR 509. Introduction to Educational Research. 3 Credits.
An introduction to the research methodologies used to study education. The course covers quantitative as well as qualitative types of research. The paradigms of both types of research will be contrasted and the application of the methodologies in actual research investigated.

EFR 510. Qualitative Research Methods. 3 Credits.
Qualitative research methods are naturalistic and contextual. The methodology derives from Anthropology and other social sciences, and seeks to understand human behavior from the actors’ perspective. Students are to learn the fundamental data collection methods: observation, participant observation, and interviewing, as well as data analysis through coding and categorizing.

EFR 511. Program Evaluation. 3 Credits.
An interdisciplinary course which studies the theoretical models of program evaluation as well as professional standards. Emphasis is on the analysis of models for implementation and application in various social and public policy fields, as well as education. S.

EFR 512. Educational Tests and Measurements. 3 Credits.
An introduction to psychological tests and measurements in educational settings and various research environments. The course covers basic concepts and principles in selection, construction, application, and evaluation of educational/psychological tests and measurements. Prerequisites: EFR 515 or consent of instructor. S.

EFR 513. Large Dataset Analysis. 3 Credits.
A study of educational and social science statistics involving manipulation and analysis of large national data sets using SPSS and/or SAS. Prerequisite or Corequisite: EFR 515 or consent of instructor. On demand.

EFR 514. Discourse Analysis. 3 Credits.
Discourse analysis is a research methodology used to analyze naturally occurring language use, whether in writing or in speech. It draws from and is practiced in many social science and humanities disciplines related to the foundations of education, including linguistics, sociology, anthropology, communications, and cognitive and social psychology. This course will provide students with the building blocks of performing discourse analysis, including instruction in its philosophical foundations, its practices, and its implications.

EFR 515. Statistics I. 3 Credits.
An introduction to basic statistical methods, focusing primarily on descriptive statistics and inferential statistics up to and including two-way analysis of variance.

EFR 516. Statistics II. 3 Credits.
An in-depth study of inferential statistics with primary emphasis on analysis of variance models, multiple regression techniques, analysis of covariance and other higher-order statistical procedures. Prerequisites: EFR 515 or consent of instructor. S, SS.

EFR 517. Advanced Research Methodologies. 3 Credits.
Both qualitative and quantitative aspects of research are considered for a variety of topics, including ethics in research, use of data banks, Q-methodology, survey research, Bayesian concepts, critical theory, longitudinal research and research consultation. Comprehensive examinations in educational research are addressed. This is a capstone course in educational research. Previous or concurrent involvement in research is highly desirable. Available for doctoral level students only.
EFR 518. Multivariate Analysis. 3 Credits.
Multiple regression in generalized problem solving; discriminant analysis, factor analysis, multivariate analysis, canonical analysis, and multivariate analysis of covariance. Students are encouraged to analyze their own data including student-generated computer applications.

EFR 519. Research Seminar. 1-4 Credits.
Experimental Design--An in-depth treatment of analysis of variance designs including factorial designs, treatment by subjects designs, groups within treatment designs, latin squares, higher dimensional designs, mixed effect designs, analysis of covariance, and trend analysis. Emphasis is placed on underlying linear models. Other seminars are held on specific research topics, particularly research proposals. May be repeated. Repeatable.

EFR 520. Advanced Qualitative Research Methods. 3 Credits.
Advanced Qualitative Research Methods will engage students in more in-depth and complex theoretical and practical issues associated with the methodology. Students will conduct mini-research studies and examine qualitative studies conducted by others. Knowledge about IRB requirements will also be addressed. Prerequisites: EFR 510 or consent of instructor.

EFR 522. Mixed-Methods Research. 3 Credits.
Mixed-methods research is the practice of combining quantitative and qualitative analysis within a single study. Students will learn the history and conceptual underpinnings of this methodological practice, read exemplary empirical studies that use mixed-methods, and explore the major mixed-methods designs. To apply these understandings, students will conduct a mixed-methods study on a topic of their own interests. Prerequisites: EFR 510 and EFR 516, or consent of instructor. S.

EFR 523. Structural Equation Modeling. 3 Credits.
This course builds from analyses underpinning structural equation modeling (SEM), such as reliability, exploratory factor analysis, and multiple regression, to SEM topics including path analysis, model specification and identification, goodness of fit, confirmatory factor analysis, structural models, mediation, multiple group invariance testing, and more. To apply these lessons, students will gain skills using SEM software. Prerequisite: EFR 516 or permission of the Instructor. On demand.

EFR 524. Needs Assessment. 3 Credits.
Needs assessment is a common evaluation method. This interdisciplinary course will study the concept of needs as well as the processes and techniques of conducting needs assessment. A set of techniques for implementation and application of needs assessment in various community, education, social work, public health, business/industry settings, government, and non-profit agencies will be reviewed. F.

EFR 525. International and Comparative Education. 3 Credits.
An overview of the major issues, concepts and methods of comparative and international education. Focuses on the development of the field, the uses of comparison, the impact of globalization, and policy and practice development around the world at all levels of education. Prerequisites: EFR 500 or consent of instructor.

EFR 584. Internship in Educational Research. 1-6 Credits.
Practical experience in the conduct of educational research, analyzing data, and writing reports. Available for doctoral level students only. May be repeated. Prerequisites: Appropriate coursework in educational research and consent of the adviser and department chair. Repeatable.

EFR 590. Special Topics in Education. 1-4 Credits.
Exploration of special topics in the study of education not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

EFR 591. Readings in Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

EFR 592. Individual Research in Education. 1-4 Credits.
May be repeated. Prerequisite: Consent of instructor or advisor. Repeatable.

EFR 995. Scholarly Project. 2 Credits.
The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner. The scholarly project must be approved by the student's adviser. Prerequisite: Consent of the student's advisor. S/U grading. On demand.

EFR 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

EFR 997. Independent Study M Ed & M S. 2 Credits.
EFR 998. Thesis. 1-9 Credits.
EFR 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

Educational Leadership

FACULTY: Pauline Stonehouse, Sherryl Houdek, Larry Klundt

Degrees Granted: Master of Education (M.Ed.), Specialist Diploma (Ed.S.), Doctor of Education (Ed.D.) and Doctor of Philosophy (Ph.D.)

The Department of Educational Leadership Pk-12 Program prides itself on being a leader in the field with an internationally recognized academic program that combines theory and practice to provide a scholar-practitioner educational model. Our innovative and responsive curriculum and delivery fosters intellectual vitality and facilitates the development of our world-class students and faculty.

The academic experience is designed to provide our students with an understanding of fundamental concepts and advanced knowledge of Educational Leadership. The academic offerings apply to leadership positions in the elementary, middle, secondary, and higher education levels as well as for the non-profit sector.

Details pertaining to admission and degree requirements can be found in the degrees section.

Master of Education (M.Ed.)

Admission Requirements
1. A bachelor's degree from an accredited college or university.
2. A cumulative undergraduate GPA of 2.75 or at least 3.00 for the last two years.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
5. All applicants are required to respond to essay questions provided in the application, and submit a resume and a writing sample.
6. All PK-12 applicants are required to submit to a background check.
7. All PK-12 applicants are required to have a teaching credential. Typically, teaching experience beyond student teaching in PK-12 schools is required.

Degree Requirements
1. Thirty-four (34) credits at or above the 500 level.
2. At least 12 credits, including 2 for the EDL 997 Independent Study, must be in a single field or area of concentration.
3. At least 6 credits must be in an area or areas of concentration (major).
4. At least 6 credits must be in Educational Foundations and Research.
5. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
6. Preparation of a written Independent Study approved by the faculty advisor.

M.Ed. Degree (PK-12 Emphasis)

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
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<td>EDL 501</td>
<td>Leadership and Organizational Behavior</td>
<td>3</td>
</tr>
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<td>EDL 503</td>
<td>Leadership Analysis and Assessment</td>
<td>1-3</td>
</tr>
<tr>
<td>EDL 511</td>
<td>Effective Administrative Communications</td>
<td>3</td>
</tr>
<tr>
<td>EDL 513</td>
<td>Leading Curriculum and Learning</td>
<td>3</td>
</tr>
<tr>
<td>EDL 514</td>
<td>Supervision and Staff Development</td>
<td>3</td>
</tr>
<tr>
<td>EDL 515</td>
<td>Education Law and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>EDL 516</td>
<td>Education Finance and Policy</td>
<td>3</td>
</tr>
</tbody>
</table>
**Specialist Diploma (Spec.Dip.)**

The Specialist Diploma, available at UND only in Educational Leadership, is designed for students preparing for school administrative positions. This course of study is usually considered to be a terminal program of advanced preparation for professional practice. Upon completion of the Specialist Diploma, a student generally will have completed the requirements for an administrative credential, including those required for the position of school superintendent in North Dakota.

* A MINIMUM OF 64 SEMESTER HOURS OF COURSE WORK BEYOND THE BACHELOR’S DEGREE IS REQUIRED FOR THE SPECIALIST DIPLOMA. THE SPECIALIST DIPLOMA MUST INCLUDE APPROXIMATELY 30 CREDITS BEYOND THE MASTER’S DEGREE.

### Required Courses in General and Building Level Administration

<table>
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<tr>
<td>EDL 519</td>
<td>Internship: Curricular and Administrative Leadership</td>
<td>3</td>
</tr>
<tr>
<td>or EDL 520</td>
<td>and Middle School Principal Field Study</td>
<td></td>
</tr>
<tr>
<td>or EDL 522</td>
<td>Elementary Principal Field Study</td>
<td></td>
</tr>
<tr>
<td>EDL 535</td>
<td>Administration of Elementary School Curriculum</td>
<td>1-3</td>
</tr>
<tr>
<td>EDL 536</td>
<td>Administration of Middle School Curriculum</td>
<td>1-3</td>
</tr>
<tr>
<td>EDL 537</td>
<td>Administration of Secondary School Curriculum</td>
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### Required Courses in District Level Administration with a master’s degree in administration

<table>
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<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>EDL 523</td>
<td>The Educational Plant</td>
<td>3</td>
</tr>
<tr>
<td>EDL 524</td>
<td>Educational Personnel Administration</td>
<td>2</td>
</tr>
<tr>
<td>EDL 526</td>
<td>Business Management in Education</td>
<td>2</td>
</tr>
<tr>
<td>EDL 527</td>
<td>Legal Issues in Education</td>
<td>3</td>
</tr>
<tr>
<td>EDL 571</td>
<td>School Community Relations</td>
<td>2</td>
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</table>

### Foundations

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
<td>3</td>
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<td>Select one of the following:</td>
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<tr>
<td>EFR 501</td>
<td>Psychological Foundations of Education</td>
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<td>EFR 502</td>
<td>Issues and Trends in Education</td>
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<tr>
<td>EFR 503</td>
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<tr>
<td>EFR 508</td>
<td>Anthropological Foundations of Education</td>
<td></td>
</tr>
</tbody>
</table>

### Cognate Area(s)

A minimum of 12 credits (to a maximum of 24 credits) of course work must be in one or two cognate areas outside Educational Leadership and may be outside the field of Education. The cognate area(s) serve to support the area of emphasis.

#### Research Methods

Select from approved courses that provide the scholarly tools to support research

#### Internship

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EDL 593</td>
<td>Internship in Educational Leadership</td>
<td>1-8</td>
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</table>

#### Independent Study

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDL 997</td>
<td>Independent Study</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credits: 63-91

* These required courses include practicum in each class.

** As appropriate, elective courses are selected from one of the following areas to fulfill individual needs and goals in consultation with the Faculty Advisory Committee. A minimum of 20 credits of Educational Leadership courses is required. A concentration of 40 credits in the major (including Foundations and Educational Leadership courses and an Independent Study) is required.

- Curriculum and Instruction
- Leadership and General Administration
- Management of Resources

*** Not required but is often advisable, depending upon student experience and goals.

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**Doctor of Education (Ed.D.)**

### Admission Requirements

The following criteria will be used to assess a student’s application for admission into the doctoral programs in the Department of Educational Leadership. No single criterion can adequately predict a student’s probable success in graduate work; as such, candidates for admission to the doctoral programs are evaluated on the following criteria:

1. Completion of a master’s degree from an accredited college or university
2. Grade point average from all previous graduate work (minimum of 3.5 required)
3. Professional resume
4. Educational leadership essay
5. Statement of professional goals
6. Writing sample
7. Three (3) letters of recommendation
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the Graduate Catalog.
9. Interview. Applicants who successfully meet all the above requirements will be interviewed by members of the T&L Admissions Committee, either face-to-face on campus or via a synchronous online format. Final admission decisions will be based on the interview.
10. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
11. All PK-12 applicants are required to have a teaching credential, three years of teaching experience, and administrative experience in PK-12 environments.

### Degree Requirements

Students seeking the Doctor of Education degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Educational Leadership Department.

The Ed.D. program in Educational Leadership is designed primarily for practitioners preparing for school administration positions including elementary or secondary principalships, superintendencies, curriculum directorships, or other school district central office positions. Upon completion of the Ed.D. degree, a student generally will have completed the requirements for an
administrative credential, including those required for the position of school superintendent in North Dakota.

1. A minimum of 96 semester credit hours of course work beyond the bachelor’s degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
4. With approval of a student’s Faculty Advisory Committee, up to 30 credits from a master’s degree may be transferred from another institution.
5. Successful completion of comprehensive examinations in Educational Leadership and Educational Foundations.
6. Successful completion of a final examination.

**Educational Leadership Core Courses**

For PK-12 emphasis:

<table>
<thead>
<tr>
<th>Course</th>
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<td>Leadership and Organizational Behavior</td>
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<td>Education Law and Ethics</td>
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<td>Education Finance and Policy</td>
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</table>

**Doctoral Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EDL 503</td>
<td>Leadership Analysis and Assessment</td>
<td>1-4</td>
</tr>
<tr>
<td>EDL 572</td>
<td>Educational Systems and Planning</td>
<td>2</td>
</tr>
<tr>
<td>EDL 573</td>
<td>Administration and Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>EDL 575</td>
<td>Education and Public Policy</td>
<td>3</td>
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<tr>
<td>EDL 579</td>
<td>Special Topics in Educational Leadership</td>
<td>12</td>
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**Educational Leadership PK-12**

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<td>Special Education Law</td>
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<td>EDL 531</td>
<td>School District Leadership</td>
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<td>Staff and Program Evaluation</td>
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**Foundations of Education**

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<tbody>
<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
<td>3</td>
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</table>

Select three of the following:

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</tr>
<tr>
<td>EFR 508</td>
<td>Anthropological Foundations of Education</td>
<td></td>
</tr>
</tbody>
</table>

**Cognate Area(s)**

One or two cognate areas outside Educational Leadership and often outside the field of Education to support the area of emphasis. 12-24

**Scholarly Tools**

Select from approved courses that provide the scholarly tools to support educational research 6

**Internship**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDL 593</td>
<td>Internship in Educational Leadership</td>
<td>1-8</td>
</tr>
</tbody>
</table>

**Dissertation**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDL 999</td>
<td>Dissertation</td>
<td>10</td>
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</tbody>
</table>

Total Credits 99-121

* If the Master’s degree or Specialist Diploma did not include these courses or their equivalent, they must be completed as soon as possible after admission to the Ed.D. program.

** As appropriate, elective courses are selected from one of the following areas of emphasis to fulfill individual needs and goals in consultation with a student’s Faculty Advisory Committee. A minimum of 30 credits of Educational Leadership courses is required. A concentration of 48 credits in the major is required (including Educational Leadership courses, scholarly tools and dissertation).

- Curriculum and Instruction
- Leadership and General Administration
- Management of Resources

*** EFR 515 Statistics I (or its equivalent) may not be used to fulfill Scholarly Tools.

**** Not required but often advisable, depending upon student experience and goals and these credits are reported in your major.

**Doctor of Philosophy (Ph.D.)**

**Admission Requirements**

The following criteria will be used to assess a student’s application for admission into the doctoral programs in the Department of Educational Leadership. No single criterion can adequately predict a student’s probable success in graduate work; as such, candidates for admission to the doctoral programs are evaluated on the following criteria:

1. Completion of a master’s degree from an accredited college or university.
2. Grade point average from all previous graduate work (minimum of 3.5 required).
3. Professional resume.
4. Educational leadership essay.
5. Statement of professional goals.
6. Writing sample.
7. Three (3) letters of recommendation.
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
9. Interview. Applicants who successfully meet all the above requirements will be interviewed by members of the T&L Admissions Committee, either face-to-face on campus or via a synchronous online format. Final admission decisions will be based on the interview.
10. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
11. All PK-12 applicants are required to have a teaching credential, three years of teaching experience, and administrative experience in PK-12 environments.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Educational Leadership Department.

The Ph.D. program in Educational Leadership is designed for students preparing for positions in which research and creative experience are predominant interests. Ph.D. candidates are expected to have undertaken and completed independent research leading to an original contribution of knowledge in the field. It is generally expected that the Ph.D. dissertation will be publishable. This degree option typically provides preparation for those who aspire to leadership positions in higher education, in government agencies, or in other educational policy organizations.

1. A minimum of 90 semester credit hours of course work beyond the bachelor’s degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
4. With approval of a student’s Faculty Advisory Committee, up to 30 credits from a master’s degree may be transferred from another institution.
5. Successful completion of comprehensive examinations in Educational Leadership and Educational Research.
6. Successful completion of a final examination.
Educational Leadership Core Courses

For PK-12 emphasis:

EDL 501 Leadership and Organizational Behavior  3
EDL 511 Effective Administrative Communications  3
EDL 513 Leading Curriculum and Learning  3
EDL 514 Supervision and Staff Development  3
EDL 515 Education Law and Ethics  3
EDL 516 Education Finance and Policy  3

Doctoral Core Courses

EDL 503 Leadership Analysis and Assessment  1-4
EDL 572 Educational Systems and Planning  2
EDL 573 Administration and Organizational Behavior I  3
EDL 575 Education and Public Policy  3
EDL 579 Special Topics in Educational Leadership  12

Educational Leadership PK-12

EDL 523 The Educational Plant  3
EDL 524 Educational Personnel Administration  2
EDL 526 Business Management in Education  2
EDL 527 Legal Issues in Education  3
EDL 529 Special Education Law  3
EDL 531 School District Leadership  2
EDL 532 Staff and Program Evaluation  2
EDL 571 School Community Relations  2

Foundations of Education

EFR 500 Introduction to the Foundations of Education  3
Select one of the following:  3
EFR 501 Psychological Foundations of Education
EFR 502 Issues and Trends in Education
EFR 503 Historical Foundations of Education
EFR 504 Philosophical Foundations of Education
EFR 505 Sociological Foundations of Education
EFR 506 Multicultural Education
EFR 507 Gender, Sexuality and Education
EFR 508 Anthropological Foundations of Education

Cognate Area(s)

One or two cognate areas or one minor area outside Educational Leadership and often outside the field of Education to support the area of emphasis.  12-24

Scholarly Tools

Select from approved courses that provide the scholarly tools to support educational research  9

Internship

EDL 593 Internship in Educational Leadership  **** 1-8

Dissertation

EDL 999 Dissertation  12

Total Credits  98-124

* If the Master’s degree or Specialist Diploma did not include these courses or their equivalent, they must be completed as soon as possible after admission to the Ph.D. program.

** As appropriate, elective courses are selected from one of the following areas to fulfill individual needs and goals in consultation with a student’s Faculty Advisory Committee. A minimum of 30 credits of Educational Leadership courses is required. A concentration of 48 credits in the major (including Foundations and Educational Leadership courses, scholarly tools courses and a dissertation) is required.

- Curriculum and Instruction
- Leadership and General Administration
- Management of Resources

*** EFR 515 Statistics I (or its equivalent) may not be used to fulfill Scholarly Tools.

**** Not required but is often advisable, depending upon student experience and goals, and these credits are reported in your major.

Courses

EDL 501. Leadership and Organizational Behavior. 3 Credits.
This course provides school leaders with preparation in skills for providing purpose and direction for individuals and groups, shaping school culture and value, facilitating the development of shared strategic vision for the school, formulating goals and planning change efforts with staff, and setting priorities for one’s school in the context of community and district priorities for student and staff needs.

EDL 502. Technology and Information Systems. 2 Credits.
This course provides an understanding of selected computer applications for educational administrators. The focus of instruction is to have educational leaders use the computer as a decision-making and planning tool for carrying out communication functions of administration at the building and district levels.

EDL 503. Seminar Educational Leadership. 1-4 Credits.
Repeatable to 4 credits. Repeatable to 4 credits. S/U grading.

EDL 511. Effective Administrative Communications. 3 Credits.
This course prepares aspiring school leaders to plan for their personal and professional development; understand and use the principles of interpersonal, oral, and written communication.

EDL 512. Research, Measurement, and Program Evaluation. 3 Credits.
This course provides school leaders with an understanding of how to determine what diagnostic information is needed about students, staff, and the school environment; examine the extent to which outcomes meet or exceed defined standards, goals, or priorities for individuals or groups; draw inferences for program revisions; interpret and understand research, measurements, and evaluations; relate programs to desired outcomes; develop equivalent measures of incompetence; and design accountability mechanisms.

EDL 513. Leading Curriculum and Learning. 3 Credits.
This course provides school leaders the ability to understand major curriculum design models, interpret school district curricula, initiate needs analyses, plan and implement with staff a framework for instruction, align curriculum with anticipated outcomes, monitor social and technological developments as they affect curriculum, and adjust content as needs and conditions change. Corequisite: EDL 535 or EDL 536 or EDL 537.

EDL 514. Supervision and Staff Development. 3 Credits.
This course provides school leaders with preparation in skills for instructional improvement, working with faculty and staff to identify professional needs. Classes are designed for in-depth study and practice planning, organizing, and facilitating programs that improve faculty and staff effectiveness and are consistent with institutional goals and needs; supervising individuals and groups; providing feedback on performance; arranging for remedial assistance; engaging faculty and others to plan and participate in recruitment and development activities; and initiating self-development.

EDL 515. Education Law and Ethics. 3 Credits.
This course is designed as a beginning law course for school administrators. In addition to the acquisition of legal knowledge as it relates to P-12 education, students are introduced to ethical perspectives that frequently influence the legal decision-making process.

EDL 516. Education Finance and Policy. 3 Credits.
Includes such topics as the organization of and responsibility for education in the United States at the federal, state, and local levels; basic administrative theories, processes, and techniques; and major areas of concern in the operation of local schools. The course includes an experiential learning assignment in which students complete a budget project.

EDL 517. Social, Cultural, Political, and Community Dimensions of Schools. 4 Credits.
This course provides school leaders with an understanding of the historical, philosophical, ethical, social, and economic influences affecting education to the degree that they can apply their understandings to professional decisions. Students are expected to apply political concepts and strategies and approaches to collaboration in involving the community in decision making, building community support for integrating health and social services in support of students, and developing community support for school priorities. Throughout the course, students’ work will be expected to manifest a sensitivity to issues of diversity in a pluralistic society.

University of North Dakota 453
EDL 519. Principalship. 2 Credits.
This course provides school leaders with an understanding of the role of the building principal along with skills and techniques associated with the principalship. The topics include the principal's role in community and family relationships and collaboration, using community resources to support the academic and social needs of students and families, the development and application of policies related to students and staff, planning and delivering of curricular and cocurricular programs within the school, and the principal's role in working with staff. Students must also enroll in a one-credit field-based experience (EDL 520, 521 or 522) appropriate for their desired level of preparation for the principalship.

EDL 520. Middle School Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the middle school principal. Corequisite: EDL 519.

EDL 521. Elementary Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the elementary school principal. Corequisite: EDL 519.

EDL 522. Secondary Principal Field Study. 1 Credit.
This course provides a field-based experience in the role of the secondary school principal. Corequisite: EDL 519.

EDL 523. The Educational Plant. 3 Credits.
The purpose of this course is to provide a study of the planning, construction, modification, and maintenance of school buildings and complimentary facilities such as playgrounds, athletic fields and facilities, drop-off zones, and parking lots. This course will include appraisal of school facilities and techniques for developing and using input from the community and building and program audits.

EDL 524. Educational Personnel Administration. 2 Credits.
Study of selection, assignment, evaluation, development, and release practices for certified and non-certified school personnel; salary and contract administration in schools.

EDL 525. Business Management in Education. 2 Credits.
Study of the business function in educational organizations with emphasis on budget development and administration, accounting, purchasing, risk management, support services, and capital outlay.

EDL 527. Legal Issues in Education. 3 Credits.
Study of the legal issues affecting educational organizations with emphasis on state and federal relationships to local institutions, school boards and other governing bodies, contracts, teachers’ and students’ rights, and tort liability of educational organizations and their officers. Consideration is given to legal research and policy analysis.

EDL 529. Special Education Law. 3 Credits.
A course designed to give participants a working knowledge of the legislative, judicial, and administrative changes which have revamped the areas of teaching and administering special education since 1974. It will provide information useful to administrators, practitioners, attorneys, parents, and advocates on topics including: student records, discipline, related services, due process, least restrictive environment, and tort liability.

EDL 531. School District Leadership. 2 Credits.
A study of concerns and issues related to education leadership and administration at the district level, including relationships between the superintendent and the school board, community and school district staff.

EDL 532. Staff and Program Evaluation. 2 Credits.
A study of the evaluation of staff, including teachers, administrators, support personnel, and boards; and for purposes of accreditation, the evaluation of components that support the curriculum. Procedures, processes, and instruments will be identified and analyzed.

EDL 533. Collective Negotiations. 2 Credits.
A study of the collective bargaining process within the field of education. Includes topics such as contract language, planning for negotiations, bargaining strategies, impasse and arbitration, contract maintenance, grievance procedures, and results of the negotiations.

EDL 535. Administration of Elementary School Curriculum. 1-3 Credits.
Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A study of leadership skills for developing the administrator’s understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of an elementary curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of elementary curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive K-5 grade level curriculum and its impact on learners. Corequisite: EDL 513.

EDL 536. Administration of Middle School Curriculum. 1-3 Credits.
Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A study of leadership skills for developing the administrator’s understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of the middle school level curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of middle school level curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive 6-8 grade level curriculum and its impact on learners. Corequisite: EDL 513.

EDL 537. Administration of Secondary School Curriculum. 1-3 Credits.
Designed primarily for graduate students seeking positions as curriculum coordinators or administrative positions. A study of leadership skills for developing the administrator’s understanding of knowledge construction, adult learning, planning and implementing a framework for curriculum design and instruction, and the professional responsibility for assessing and implementation of secondary curriculum. The course examines the current issues, trends, subject areas, student achievement, and challenges for the future of middle school level curriculum. The student will research the current best practices for application of administrative skills in relationship to supervision of a comprehensive 9-12 grade level curriculum and its impact on learners. Corequisite: EDL 513.

EDL 538. Auxiliary School Functions. 3 Credits.
Overview of school business and facilities management for educational administrators. Topics include: introduction to special area budgeting and accounting; insurance and risk management; forecasting; vendor relations; supervision of classified and support staff; management of support services, e.g., transportation, food service; facility operation and maintenance; and space utilization analysis, allocation; and cooperative community use of facilities.

EDL 571. School Community Relations. 2 Credits.
Study of the responsibility of the classroom attendance unit, and district personnel in public information efforts; design, use, and analysis of surveys; study of involvement of parents and other community members in resource, advisory, and decision-making activities; preparation of news releases and public information materials; study of relationships to media personnel.

EDL 572. Educational Systems and Planning. 2 Credits.
A study of the planning process including topics such as establishing goals; assessing needs; identifying resources; and generating, analyzing, and selecting alternatives. Processes and techniques in planning will be emphasized.

EDL 573. Administration and Organizational Behavior I. 3 Credits.
A study and critique of selected theories and research in administration and organizational behavior including topics such as leadership; formal and informal structure; communication; change and intervention; motivation and morale; interpersonal relations and conflict management; small-group processes; and personality, values, and ethics.

EDL 574. Administration and Organizational Behavior II. 3 Credits.
A continuation of Administration and Organizational Behavior I. Provides the student with the opportunity to design and carry out an original field study project in organizational behavior, participate in critiquing studies designed and completed by fellow students, and engage in individualized study in a topical area related to behavior in organizations.

EDL 575. Education and Public Policy. 3 Credits.
A study of the development of policy issues, analysis of policy formation, implementation analysis, and structures and actors in policy activity.
EDL 579. Special Topics in Educational Leadership, 1-4 Credits.
Exploration of special topics in the study of educational leadership not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

EDL 589. Superintendence Series, 1 Credit.
Repeatable.

EDL 593. Internship in Educational Leadership, 1-8 Credits.
This is a culminating experience primarily for Specialist Diploma and doctoral students. May be repeated. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of the advisor and instructor. Repeatable.

EDL 597. Readings in Educational Leadership, 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisites: Consent of professor and instructor. Repeatable.

EDL 599. Individual Research in Educational Leadership, 1-4 Credits.
May be repeated. Prerequisites: Consent of advisor and instructor. Repeatable.

EDL 996. Continuing Enrollment, 1-12 Credits.
Repeatable. S/U grading.

EDL 997. Independent Study, 1-4 Credits.
Repeatable to 4 credits.

EDL 998. Thesis, 1-9 Credits.
Repeatable. S/U grading.

EDL 999, Dissertation, 1-12 Credits.
Repeatable to 12 credits.

Teaching and Learning
http://education.und.edu/teaching-and-learning/

FACULTY: Baker (Chair), Barrentine, Beck, Borgeson, Borysewicz, Bunris, Chalmers, Chiasson, Combs, Gallo, Gourneau, Grabe, Grave, Guy, W. Hung, Ingwalson, Jacobson, Johnson, Keengwe, Lee, Mahar, Olson, Onchwari, Ozaki, Pearson, Salyers, Shafer, Smart, Terras, Van Eck, Walker, Yearwood and Zidon

Graduate Programs Offered in the Department of Teaching and Learning

Doctoral Programs
Teaching and Learning Ed.D., Ph.D.

Masters and Certificate Programs
Early Childhood M.S.
Education
Education-General M.S.
Studies
Elementary M.Ed., M.S.
Education
English Language M.Ed.
Learner Education
(TESOL)
Certificate
Reading Education M.Ed., M.S.
Special Education M.Ed., M.S.
Certificate (ASD)
Instructional Design and Technology M.Ed., M.S.
Certificate

Degrees Granted: Doctor of Education (Ed.D.) and Doctor of Philosophy (Ph.D.)
The Doctor of Philosophy (Ph.D.) and Doctor of Education (Ed.D.) programs in Teaching and Learning are designed to prepare individuals for leadership and teaching positions in schools, colleges and universities, and public or private agencies. The doctoral program in Teaching and Learning offers three areas of emphasis:

- **Higher Education** (preparation to be a college or university professor of an academic discipline and all of its responsibilities).
- **Teacher Education** (preparation to be an educator of teachers in a college or university setting and/or as a person providing consultation and in-service to teachers in pre-K-12 schools).
- **Instructional Design and Technology** (preparation to be researchers and scholars. The focus is on understanding various areas in instructional design, human learning, and the integration of technology).

Coursework for all areas of emphasis is offered by faculty from the department of Teaching and Learning. Faculty members are able to serve as advisors to doctoral students.

Students are specifically admitted to the Ed.D. or the Ph.D. program.

- The Ed.D. degree emphasizes professional practice and educational foundations and theory.
- The Ph.D. degree emphasizes research, creative scholarship, and educational theory.

The doctoral student and advisory committee design the doctoral program of study to meet individual needs within the framework of guidelines set by the School of Graduate Studies and by the program faculty. School of Graduate Studies requirements for the Ph.D. and the Ed.D. are stated in the Degree Requirements section.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Mission Statement and Program Goals

It is the mission of the Teaching and Learning Doctoral Program to prepare persons for leadership and teaching positions in schools, colleges or universities, and public or private agencies.

**Goal 1:** The student will demonstrate knowledge of how personal educational practice guides and supports the learning of others.

**Goal 2:** The student will demonstrate the ability to apply research and research methods relevant to the field of study.

**Goal 3:** The student will demonstrate knowledge and application of educational practices related to the foundations (personal, historical, philosophical, sociological, anthropological, psychological, and multicultural) for learning and teaching.

**Goal 4:** The student will demonstrate knowledge and skills in understanding ways of engaging learners in the active construction of knowledge relevant to the advanced discipline of study.

Doctor of Education (Ed.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

Applicants should anticipate that the materials they submit will be held to high standards with the following basic expectations:

1. Graduate grade point average of 3.5 and above
2. Excellent writing skills
3. Three letters of recommendation that address your academic ability, professional accomplishments related to your field of study, and positive character traits
4. A statement of clear professional/educational goals that can be met by our program as specified in the graduate catalog

Your application must also include the following:

1. Transcripts
2. Professional resume
3. Essay. An original essay not to exceed four double-spaced pages (exclusive of references) on a controversial issue or a problem facing education today. The writing will be reviewed for:
   a. overall suitablity for doctoral level study;
   b. cohesive development of ideas;
   c. support for ideas; and
   d. writing conventions. The applicant must also sign a statement attesting that the work submitted was that of the applicant.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctor of Education degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Teaching and Learning Department.

1. Completion of 96 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree (maximum of 30 semester credit hours) may be transferred from another institution that offers post-master’s degrees in the discipline.
4. At least one-half of the work must be in the major field, including:
   • A dissertation of 10 credits
   • A minimum of 12 credits in the Foundations of Education
   • A minimum of 6 credits of scholarly tools*
   • At least 12 credits of a minor or cognate in a supporting area
5. One of the following residency options.
   * Scholarly tool options for the doctoral students in education are described in the Education departmental requirements section of this catalog.

Residency Requirements for Doctoral Programs

The purpose of residency is to provide an opportunity for sustained and concentrated intellectual effort, to provide for immersion in a research environment, and to permit extensive interaction with fellow students and faculty of the major department.

The residency for programs in education is designed to provide the student with the experiences outlined by the School of Graduate Studies. It is expected that students will engage in serious scholarship and will reflect on their learning and experiences. The expectation is that the students will integrate their doctoral study with the higher education area of emphasis option.

Students with a master’s degree in the content field and without previous background in the study of education are eligible for admission to the Ph.D. program with the higher education area of emphasis option.

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

Applicants should anticipate that the materials they submit will be held to high standards with the following basic expectations:
1. Graduate grade point average of 3.5 and above
2. Excellent writing skills
3. Three letters of recommendation that address your academic ability, professional accomplishments related to your field of study, and positive character traits
4. A statement of clear professional/educational goals that can be met by our program as specified in the graduate catalog

Your application must also include the following:
1. Transcripts
2. Professional resume
3. Essay. An original essay not to exceed four double-spaced pages (exclusive of references) on a controversial issue or a problem facing education today. The writing will be reviewed for:
   a. overall suitability for doctoral level study;
   b. cohesive development of ideas;
   c. support for ideas; and
   d. writing conventions. The applicant must also sign a statement attesting that the work submitted was that of the applicant.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Students with a master’s degree in the content field and without previous background in the study of education are eligible for admission to the Ph.D. program with the higher education area of emphasis option.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Teaching and Learning Department.

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree (maximum of 30 semester credit hours) may be transferred from another institution that offers post-master’s degrees in the discipline.
4. At least one-half of the work must be in the major field, including:
   • At least 12 credits of a minor or cognate in a supporting area
   • A dissertation of 10 credits
   • A minimum of 12 credits in the Foundations of Education
   • A minimum of 6 credits of scholarly tools*
   • At least 12 credits of a minor or cognate in a supporting area
5. Meet one of the three residency options described below.

Residency Requirements for Doctoral Programs

The purpose of residency is to provide an opportunity for sustained and concentrated intellectual effort, to provide for immersion in a research environment, and to permit extensive interaction with fellow students and faculty of the major department.

The residency for programs in education is designed to provide the student with the experiences outlined by the School of Graduate Studies. It is expected that students will engage in serious scholarship and will reflect on their learning and experiences. The expectation is that the students will integrate their doctoral study in order that the program of study they pursue will become a holistic and
unified experience. (The residency option is normally declared on the student’s program of study.) The education faculty has outlined some of the conditions required for these goals to be realized. A doctoral student in Teaching and Learning can meet the residency requirement in any one of these ways:

- Students will complete a residency while enrolled in a minimum of 9 semester hours of credit during each of two consecutive semesters (Fall, Spring or Spring, Fall). Students in this option are encouraged, but are not required, to enroll in a Doctoral Seminar during their residency or at another time in the program. If a student is a GRA, GSA, or GTA, the number of credits that the student may take for this option is less and specified in the catalog.
- Students will complete a residency while enrolled in a minimum of eight semester hours of credit during each of three consecutive summer sessions and in a minimum of two Doctoral Seminars following their first and second or third summers in residence.
- Students will complete a residency over a period of three consecutive years of continuous enrollment in a minimum of 36 semester hours of credit (12 credits per year for 3 years) to include a minimum of two Doctoral Seminars during the period of residency.

Courses

T&L 513. Linguistics for ELL Teachers. 3 Credits.
This course introduces the complexities of human language through the study of phonetics, phonology, morphology, syntax and semantics. Additional topics addressed include the brain and language, history of the English language, psycholinguistics, writing systems and language in social contexts. F,S,SS.

T&L 514. Introduction to Multilingual Education. 3 Credits.
This course explores language education models, programs and policies with an emphasis on English language learners (ELLs). Political, legal, historical, and cultural contexts of multilingual education will be discussed with a focus on both U.S. and global challenges.

T&L 515. Middle School Curriculum. 3 Credits.
This course examines the middle school curriculum and instructional strategies as well as the needs of early adolescents. The course focuses on the roles teachers play in incorporating a guided, interdisciplinary, collaborative team approach. The studies include the components of curriculum learning, advisory, exploration, learning communities) and instruction (differentiation, cooperative learning, learning styles, instructional strategies) incorporated in middle schools.

T&L 516. Philosophy and Foundations of Middle School Education. 3 Credits.
This course examines the historical and philosophical background of middle level education. The focus is on the roles teachers/administrators play in incorporating this guided, interdisciplinary, collaborative team approach that assists students during these fundamentally transformative years. The course looks at the philosophical aspect of the curriculum and instructional component. The studies explore contemporary issues associated with the middle school as well as the adaptations necessary for special circumstances affiliated with middle schools.

T&L 518. Science in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing inquiry-based science in elementary classrooms.

T&L 519. Social Studies in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing social studies in elementary classrooms.

T&L 520. Curriculum and Instruction in the Elementary School. 4 Credits.
A study of processes for planning, implementing, and evaluating curriculum and improving instruction in elementary schools.

T&L 521. Differentiated Instruction. 3 Credits.
An introduction to the principles of differentiated instruction. Topics of study include: brain-based learning, responsive instructional and assessment strategies, linking curriculum and instruction to learner needs, organizing and managing a differentiated classroom, and relevant resources for implementation.

T&L 522. Mathematics in the Elementary School. 3 Credits.
A study of current trends and practices associated with teaching and assessing inquiry-based math in elementary classrooms.

T&L 523. Literacy Instruction for English Language Learners. 3 Credits.
This course addresses the foundations of teaching English language and literacy to English LanLanguage Learners (ELLs) and includes study of various approaches to ELL/bilingual education, methods of instruction, assessment of English language proficiency, and strategies to make content learning comprehensible for ELLs. Emphasis will be placed on praxis and current research in the field.

T&L 524. Reading in the Content Areas. 2 Credits.
How and why reading should be taught in the content areas (i.e. Social Studies, Science, Mathematics, etc.). Research studies in the field of content reading and a variety of instructional practices are reviewed.

T&L 525. Writing in the Classroom. 3 Credits.
This course explores the role of play in creative, physical and social-emotional development, and the way in which play is incorporated into educational and other programmatic settings. Students will explore how assessment of play indicates a child's development, and they will use assessment to promote Developmentally Appropriate Practices (DAP) for PreK-Grade 3 (ages 3-8) learners.

T&L 526. Play in Development and Early Childhood Education. 3 Credits.
This course focuses on play as a process that is developmental, cultural, social, and individual. Emphasis is on effective implementation of the essential structures of writing workshop and on monitoring and assessing writers’ growth.

T&L 527. Curricular Foundations in Early Childhood Education. 3 Credits.
This course examines the historical, philosophical, cultural, race, class, and gender influences on curriculum in early childhood, including the philosophy and mission of the Department of Teaching and Learning.

T&L 528. Children’s Literature in the Classroom. 3 Credits.
This course is a study of children's literature and literary criticism which serves as the foundation for examining teaching methods that develop children's engagement with literature and promote reading achievement.

T&L 529. Language Development & Cognition in Children. 3 Credits.
This course provides foundational information about language and cognitive development in children. The course content will also analyze typical and atypical language and cognitive development. The focus of the course will include children birth to age eight.

T&L 530. Foundations of Reading Instruction. 3-4 Credits.
This course focuses on the relationship between reading theory, research, contemporary issues and instructional practice. Emphasis is placed on strategic systems related to effective reading, instructional approaches that support the development of these strategic systems and assessment as collecting evidence of effective reading behaviors.

T&L 531. Early Literacy Development and Instruction. 3 Credits.
A study of early literacy processes including phonemic and print awareness, word recognition, comprehension, and writing. Emphasis is on reviewing current research and theory, assessment and instruction practices, and bridging language and literacy development in literacy rich environments.

T&L 532. Leadership in Literacy. 3 Credits.
The role of the literacy coach is to support teachers in closing the gap between learners’ performance and achievement in reading and writing. Topics in this course will include providing leadership for a school's literacy program, collaboration with teachers and administrators, curriculum issues, knowledge of literacy standards, and professional development facilitation. On demand.

T&L 533. Reading in the Secondary School. 2 Credits.
Development of reading-study skills in the content subject areas and reading strategy development.

T&L 534. Basic Reading Diagnosis and Remediation. 2 Credits.
Focuses on common causes of reading disability, methods of diagnosis, and corrective reading programs in the classroom. Corequisite: T&L 583.

T&L 535. Advanced Reading/Language Arts Diagnosis and Remediation. 2 Credits.
Analysis of interrelationships of learning difficulties in language arts areas and procedures for remediation. Prerequisites: T&L 530 and T&L 534.

T&L 536. Teaching Language Arts. 3 Credits.
Consider the objectives of language arts programs, methods of instruction, and recent curricular trends. Recent research is read and critiqued. On demand.
T&L 537. ELL Methods and Materials. 3 Credits.
This course explores current methods and materials in ELL education, with a focus on teaching academic language and sheltered content instruction. F,S,SS.

T&L 538. Supervision of Student Teaching. 2 Credits.
For supervisors and directors of student teaching in colleges and cooperating schools. Principles and practices on how to provide the most beneficial experiences for student teachers.

T&L 539. College Teaching. 3 Credits.
Explores learning styles and teaching styles, the components and responsibilities involved in college teaching, methods of teaching and motivating students, and current issues related to instruction in the college classroom.

T&L 540. Theory and Philosophies of Curriculum in Schools. 3 Credits.
This course explores the historical development of the K-12 curriculum, the philosophical and theoretical aspects applied to curriculum, and the social conditions that impact curriculum.

T&L 541. History of Higher Education in the United States. 3 Credits.
Study of major events and people shaping higher education in the U.S. Role, philosophy, and organization of institutions of higher education discussed.

T&L 542. Models of Teaching. 3 Credits.
This course focuses on various models of teaching: social interaction, information-processing, inquiry and behavioral. The purpose of the course is to provide teachers with a variety of instructional models related to meaningful learning experiences for students.

T&L 543. Scholarly Writing. 3 Credits.
Designed to assist students with learning the art of scholarly writing, this course will aid students in designing, formatting, and completing research-based and other scholarly writing projects, as well as understanding the rules and norms of academic publishing.

T&L 544. Assessment in Higher Education. 3 Credits.
A wide range of assessment issues in higher education will be explored. This includes course, program, and institutional assessment as well as classroom assessment techniques. Students will examine and understand the assessment process.

T&L 545. Adult Learners. 3 Credits.
This course will cover theories of adult development, current research on adult learners, ways of assessing the needs and interests of adult learners, and ways of creating environments in which adult learners can thrive.

T&L 546. College Students with Special Needs. 3 Credits.
This course explores the range of special needs college students bring to campus and how faculty, staff, and administrators might appropriately meet those needs. Prerequisite: Admission to the School of Graduate Studies or instructor permission. S.

T&L 547. Technology in Higher Education. 3 Credits.
Students will examine the various uses and integration of technology and media in higher education by faculty in their attempt to engage learners with each other, the course content, and with instructors.

T&L 548. The Professoriate. 3 Credits.
This course is a study of the development of the American professoriate by way of historical, scholarly, popular, and contemporary perspectives. It also examines the transition of new faculty members to their initial academic appointment.

T&L 549. Seminar. 1-4 Credits.
The seminar will focus on a specific topic relating to teaching and learning. The specific content will vary depending upon student needs and faculty resources. Repeatable. S/U grading.

T&L 550. Assessment and Evaluation in ELL Education. 3 Credits.
This course combines readings and theoretical discussion of assessment with hands-on experience in assessing ELLs. Students will learn how to use a variety of formal and informal assessments with a focus on how to use assessment data in planning instruction. Topics will include classroom-based assessments, language proficiency testing, testing accommodations for ELLs, and assessment of ELLs for special education and gifted education, and ELL program evaluation.

T&L 551. Second Language Acquisition for ELL Teachers. 3 Credits.
This course will explore the socio- and psycho-linguistic aspects of interlanguage by studying the theories and research of first and second language acquisition. Students will examine the nature of learners and their individual differences during the stages of language development, with a focus on children and K-12 classrooms.

T&L 552. Collaborative Relationships: Home, School and Community. 3 Credits.
A course appropriate for anyone working with families, early childhood educators, general educators, special educators, related service personnel, administrators and outside agency personnel. Topics covered include: (1) the various models of collaboration and consultation and the stages of each; (2) communication skills; (3) problem-solving; (4) conflict management; (5) diverse perspectives; (6) information collection procedures; (7) supervisory skills; (8) family characteristics and structure across the lifespan; (9) family focused intervention; (10) school choices; and (11) school issues such as poverty, domestic violence, teasing, bullying, and school violence.

T&L 555. Middle School Science and Engineering Lab1:Solids. 2 Credits.

T&L 559A. MS Sci.Eng-2: Solids. 3 Credits.
Prerequisites: T&L 558, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 559B. MS Sci.Eng-2: Solids. 3 Credits.
Prerequisites: T&L 558, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 566. Brain in Memory and Learning. 3 Credits.
Prerequisite: Admissions to Grad School.

T&L 567. Language Structure and Analysis for ELL Teachers. 3 Credits.
This course explores the grammatical and discourse structures of the modern English language, analysis of grammar and discourse with a focus on specific problem areas for ELLs, and pedagogical implications for English language development.

T&L 568. Research and Advocacy in TESOL. 3 Credits.
This course prepares teachers to both understand and conduct research in TESOL. Emphasis will be placed on using research data to advocate for changes and improvement in ELL education.

T&L 569. Action Research. 3 Credits.
The study of the philosophy and methods of action research. Emphasis is focused on analysis of and reflection on one's teaching for the purpose of improvements in student learning. Prerequisite: Graduate status. S.

T&L 571. Teacher Education. 3 Credits.
Practices, issues, and trends in the design and implementation and assessment of programs for the preparation and development of K-12 teachers.

T&L 572. Teacher Education: Focus on the Learner. 3 Credits.
The study of teacher education in relation to the lives of P-12 students. This course includes the examination of children and their lives through aspects of race, religion, socioeconomic, linguistics and age, and considers educational implications for preservice and inservice teachers.

T&L 573. Middle School Science and Engineering Lab2:LIq/Gas. 2 Credits.
T&L 574. MS Sci.Eng-4: Liquid/Gas. 3 Credits.
Prerequisites: T&L 573, admission to Graduate School, ND Teacher licensure and Admission to program "Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships".

T&L 575. Middle School Science and Engineering Lab3:Mot/Elec. 2 Credits.

T&L 576A. MS Sci.Eng.-6:Motion/Electric. 3 Credits.
Prerequisites: T&L 575, admission to Graduate School, ND Teacher Licensure and employment as a teacher in a ND school.

T&L 576B. MS Sci.Eng.-6:Motion/Electric. 3 Credits.
Prerequisite: T&L 576A.

T&L 577. Assessment of Learning. 3 Credits.
This course addresses the theory and practice of assessment, specifically the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of educational experiences.
T&L 579. Classroom Based Inquiry. 3 Credits.
Concepts learned in T&L 569 will be looked at in-depth and theoretical constructs such as Living Theory. Self Study, and Critical Theory constructs will be studied. Students plan and conduct an in-depth inquiry project within a school setting, complete the associated IRB, and create academic poster and/or prepare a proposal of the Inquiry project for a professional setting. Prerequisites: TL graduate status and T&L 569; or by permission of instructor. F.S.

T&L 580. Practicum in Schools. 1-4 Credits.
Practicum in study of desirable school practices, observations in nearby schools, and application of research findings in solving practical problems. Prerequisites: Appropriate foundational and major area courses, and consent of the instructor and advisor. Repeatable.

T&L 581. Thesis. 1-9 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program. Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

T&L 582. Resident Internship. 4 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program. Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

T&L 583. Reading Clinic. 2 Credits.

T&L 584. Internship in Education. 1-8 Credits.
This is a culminating experience primarily for Sixth year and Doctoral students. The internships will be identified in one of the following sub-areas: (A) Educational Administration, (B) Special Education, (C) Curriculum, (D) Educational Research, or (E) Teacher Education. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of advisor and instructor. Repeatable.

T&L 589. Professional Development: Resident Teacher Program. 2 Credits.
This field-based experience provides mentoring and coaching, translates baccalaureate theory and research into practice, and requires active participation in the school placement and classroom setting. Issues and topics relevant to first year teachers in graduate education are emphasized through field work and discussions. Prerequisite: Admission into the Elementary Education Resident Teacher Program. SS.

T&L 590. Special Topics. 1-4 Credits.
Exploration of special topics in the study of education not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

T&L 591. Readings in Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisite: Consent of instructor and advisor. Repeatable.

T&L 593. Independent Projects. 1-4 Credits.
Repeatable.

T&L 596. Individual Research in Education. 1-4 Credits.
Prerequisite: Consent of instructor and advisor. Repeatable.

T&L 595. Scholarly Project. 2 Credits.
The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner that is directly related to their roles as teachers, program evaluators, and action researchers. The scholarly project must be approved by the student's advisor.

T&L 596. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

T&L 597. Independent Study. 2 Credits.

T&L 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

T&L 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

Undergraduate Courses for Graduate Credit

T&L 322. Administration and Leadership in Early Childhood Education. 3 Credits.
An investigation of patterns of administration, curriculum organization, spatial resources, and staffing in early childhood settings, serving children 0-8 years old. Topics include federal and state laws and emerging trends in preschool and primary education in the state, region, and nation. Sixteen (16) hours of field experience. Prerequisite: Admission to the Teacher Education program. S.

T&L 422. Development of the Gifted and Talented. 2 Credits.
Research and theory for understanding the development needs of the more able child in early childhood and in educational experiences. S.

T&L 423. Assessment Program Planning/Special Needs Students. 3 Credits.
A study of the principles and practices of: (1) obtaining diagnostic information on school-related problems of a student; (2) assimilating this information and prescribing appropriate alterations based on continuous measurement data. Prerequisites: T&L 315 and T&L 319. F.S.

T&L 493. Workshop. 1-4 Credits.
Special problems in Special Education; consideration of special problems of concern to the Special Education teacher and other educators. Repeatable to 8 credits. F.S.

Curriculum and Instruction

Undergraduate Courses for Graduate Credit

T&L 579. Classroom Based Inquiry. 3 Credits.
Concepts learned in T&L 569 will be looked at in-depth and theoretical constructs such as Living Theory, Self Study, and Critical Theory constructs will be studied. Students plan and conduct an in-depth inquiry project within a school setting, complete the associated IRB, and create academic poster and/or prepare a proposal of the Inquiry project for a professional setting. Prerequisites: TL graduate status and T&L 569; or by permission of instructor. F.S.

T&L 580. Practicum in Schools. 1-4 Credits.
Practicum in study of desirable school practices, observations in nearby schools, and application of research findings in solving practical problems. Prerequisites: Appropriate foundational and major area courses, and consent of the instructor and advisor. Repeatable.

T&L 581. Thesis. 1-9 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program. Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

T&L 582. Resident Internship. 4 Credits.
A full-time, year-long internship experience conducted in a cooperating school district. Interns are assigned as members of instructional teams with full responsibility for a portion of the cooperating school's instructional program. Prerequisites: Participation in the summer program prior to the internship and teaching licensure (see dept for approval).

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This is a culminating experience primarily for Sixth year and Doctoral students. The internships will be identified in one of the following sub-areas: (A) Educational Administration, (B) Special Education, (C) Curriculum, (D) Educational Research, or (E) Teacher Education. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of advisor and instructor. Repeatable.

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Prerequisite: Consent of instructor and advisor. Repeatable.

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The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner that is directly related to their roles as teachers, program evaluators, and action researchers. The scholarly project must be approved by the student's advisor.

T&L 596. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

T&L 597. Independent Study. 2 Credits.

T&L 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

T&L 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.
Admission Process

1. Complete the School of Graduate Studies online application.
2. Submit the application fee of $35.
3. Identify three individuals who will complete the recommendation form: a) an education supervisor or administrator; b) a professional colleague or university professor; 3) a person of your choosing.
4. Send official transcripts from each institution attended to the School of Graduate Studies.
5. Complete the personal statement and attach it in the essay section of the online application. The personal statement should address three prompts and should be no more than 5 double-spaced pages.

- Provide a narrative describing your chronological history of all professional teaching and administration experience, as well as academic honors or achievements you have earned.
- What are the characteristics, attitudes, values, and/or skills that you think will make you a good candidate for your professional role?
- Describe several personal and professional goals you would like to achieve in the next five years. Include in your description reasons why these goals are important to you.

Degree Requirements

Students must satisfy all general requirements established by the School of Graduate Studies as well as specific requirements established for the major in Curriculum and Instruction:

1. A minimum of 32 credits including credits required for the Curriculum and Instruction major.
2. A maximum of one-fourth of the credit hours maybe transferred from another institution, depending on the courses and grades.
3. Two credits of Scholarly Project (T&L 995) or Independent Study (T&L 997) or four credits of Thesis (T&L 998).
5. Six credits of electives for the major (e.g., EFR 500 Foundations of Educational Thought, T&L 521 Differentiated Instruction, T&L 590 Special Topics: Technology in the Schools; T&L 524 Reading in the Content Areas, EFR 509 Introduction to Educational Research 3, EFR 515 Statistics I).
6. Five to six credits of scholarly tools (e.g., T&L 569 Action Research, EFR 509 Introduction to Educational Research, EFR 515 Statistics I).
7. Nine credits of course work that complements the major in Curriculum and Instruction (e.g., content courses in a discipline or coursework in another education program).

Sample Program of Study

Requirements for the Major (Core – 11-13 Credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 540</td>
<td>Theory and Philosophies of Curriculum in Schools</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 542</td>
<td>Models of Teaching</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 577</td>
<td>Assessment of Learning</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
<td>2</td>
</tr>
<tr>
<td>or</td>
<td>T&amp;L 997</td>
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</tr>
<tr>
<td>or</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>or</td>
<td>T&amp;L 998</td>
<td></td>
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<tr>
<td></td>
<td>Thesis</td>
<td>1-9</td>
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</tbody>
</table>

Electives for the Major (6 Credits from the following or courses approved by an advisor)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 506</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 521</td>
<td>Differentiated Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 524</td>
<td>Reading in the Content Areas</td>
<td>2</td>
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</tbody>
</table>

Research (6 credits from the following)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 579</td>
<td>Classroom Based Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>EFR 515</td>
<td>Statistics I</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives – Cognate (9 credits)

Choose 9 credits of coursework that complements the major

Early Childhood Education

http://education.und.edu/teaching-and-learning/early-childhood-education/

FACULTY: Gallo, Olsen (Emeritus), Onchwari, Votava (Graduate Director) and J. Yearwood

Degree Granted: Master of Science (M.S.)

The focus of the M.S. program in Early Childhood Education is on the advanced preparation of teachers and leaders in the field of Early Childhood Education. The program addresses the education of children age birth through grade 3 by concentrating on the study of children ages 0-8 and the implications such study holds for educational practice. This degree does not lead to initial teacher licensure. Those pursuing this program will be prepared as professional teachers/leaders in a variety of early childhood settings, including public and private schools (Pre-K-grade 3), Head Start programs, child development and childcare centers, and college and University settings.

The Early Childhood Education program is administered through the Department of Teaching & Learning in the College of Education and Human Development (EHD) and the UND School of Graduate Studies. The programs follow the policies of Early Childhood Education, the Department of Teaching & Learning, EHD, UND, UND School of Graduate Studies and NDUS.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Mission Statement and Program Goals

The mission of the Early Childhood Education program is to teach and empower educators and leaders in the field of Early Childhood Education. The focus in this program is on educating teachers to be careful and open-minded observers who develop early learning curriculum and programs with the child in mind; thus, the child is at the center of the program, and the source of study.

The program is committed to establishing a theoretical foundation based on research in the field of early childhood education that is combined with practical experiences to prepare professionals who will:

1. Encourage the child’s natural curiosity and exploration of the environment;
2. Develop an understanding of human diversity and recognize its value in a community of learners;
3. Become reflective in their approach to teaching and leadership;
4. Develop supportive and productive learning environments for children, teachers, parents, and support staff;
5. Integrate knowledge of children with special needs into curriculum and program development.

Early Childhood Education

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.
Degree Requirements

The M.S. degree in Early Childhood Education is available in two options: non-thesis option and the thesis option. The program of study is developed together with the student's advisor (non-thesis option, 32 credits) or with a student's thesis committee (thesis option, 30 credits).

Non-Thesis Option:

1. Thirty-two credits including credits required for the major.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. All credits must be approved graduate level courses.
5. The program may include the major, the major and the minor, or the major and a cognate area. The major must include 20 credits from the major department and the minor or cognate must include nine credits.
6. Completion of a two-credit practicum (60 hours) in an early childhood setting.
7. Preparation of a written independent study or scholarly project approved by the faculty adviser.

Thesis Option:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to a 4-6-credit T&L 998 Thesis.
2. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
3. All credits must be approved graduate level courses.
4. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include 20 credits from the major department and a minor or cognate must include nine credits.
5. Preparation and successful defense of a thesis.

This program of graduate study can be completed in 18 months going full-time or 24 months going part-time (two courses per semester). Courses are offered on campus, online and a combination of the two.

Required Courses:

<table>
<thead>
<tr>
<th>Major</th>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SPED 510</td>
<td>Early Intervention for Children with Special Needs</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 526</td>
<td>Play in Development and Early Childhood Education</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 527</td>
<td>Curricular Foundations in Early Childhood Education</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 529</td>
<td>Language Development &amp; Cognition in Children</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 580</td>
<td>Practicum in Schools</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
<td>2-6</td>
<td></td>
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<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
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<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
<td>3</td>
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</tbody>
</table>

Electives

The student will choose electives in consultation with his/her adviser. 0-4

Total Credits

32

Students are required to take T&L 580 Practicum in Schools. This practicum requires 60 hours in an early childhood setting, which could be the candidate's work setting if it meets required accreditation standards.

Elementary Education

http://education.und.edu/teaching-and-learning/elementary-education/graduate/index.cfm

FACULTY: Baker, Barrentine, Beck, Combs, Gourneau (Graduate Director), Guy, Helgeson, Keengwe, Rogers, Shafer, and Walker

Degrees Granted: Master of Science (M.S.) and Master of Education (M.Ed.)

The Master of Science (MS) and the Master of Education (M.Ed.) degrees are offered by the Department of Teaching and Learning in the College of Education and Human Development. These two Elementary Education Master Programs strive for excellence in education for all learners. The Programs are dedicated to the professional development of responsive teachers as learners, active agents of learning, and articulate visionaries. We provide high quality educational experiences that emphasize inquiry, reflection, and collaboration. In order to be accessible to our graduate students we offer Programs in a variety of formats including campus based and distance degrees.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Master of Science (M.S.)

Mission Statement and Program Goals

The Master of Science: Elementary Education is committed to preparing knowledgeable and responsive educators through the advanced study of research, creative scholarship, and educational theory. Students in the program will:

- Commit to the continuing process of learning with an emphasis on learning to teach.
- Become more confident, responsive, and reflective as decision-makers in their educational learning communities.
- Plan, implement, and evaluate strategies of research in education.
- Examine practices and assumptions in schools, including moral and ethical standards along with the concerns of schools in society.
- Embrace inclusive diversity by meeting the varied needs of students and communities.

This program is offered entirely online. Note: Licensure is not required for admission; however, this program does not lead to initial licensure.

Master of Education (M.Ed.)

Mission Statement and Program Goals

The Master of Education Degree in Elementary Education: Elementary Education is committed to preparing knowledgeable and responsive educators...
through the advanced study of professional practice, theory, and foundations of education. Students in the program will:

• Commit to the continuing process of learning with an emphasis on learning to teach.
• Examine best practices, skills, and values to effectively teach all students.
• Become more confident, responsive, and reflective as decision-makers in their educational learning communities.
• Learn to adapt curricular experiences to provide for individual needs, backgrounds, interests, and learning standards.
• Embrace inclusive diversity by meeting the varied needs of students and communities.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Teacher Licensure or a baccalaureate degree
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Refer to the Admissions section of the graduate catalog for additional information on admission requirements and application procedures.

Degree Requirements

Degree requirements for the Master of Science Degree in Elementary Education include:

A detailed description of the M.S. degree may be found in the Degree Requirements section. Scholarly tool requirements are described in the Education departmental section.

The Master of Science Degree in Elementary Education is available in two tracks. Track I, either thesis or non-thesis, is open to licensed or non-licensed persons who wish to follow a research-oriented program of study. Track I requires a minimum of five credits of scholarly tool coursework and allows a maximum three credits of readings.

Track II, available only in the non-thesis option, provides opportunity for non-licensed persons to study Elementary Education at the graduate level. Track II requires a minimum of six credits of coursework in Foundations of Education.

Non-Thesis Option:
1. Thirty-two (32) credits including credits required for the major.
2. A minimum of three credits of Independent Study
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.

Thesis Option:
1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

Required Courses for the Master of Science

Major: Elementary Education (Track I)

**Required Core**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 518</td>
<td>Science in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 519</td>
<td>Social Studies in the Elementary School</td>
<td>3</td>
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</table>

**Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 522</td>
<td>Mathematics in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 580</td>
<td>Practicum in Schools</td>
<td>1-4</td>
</tr>
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</table>

**Scholarly Tools**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
<td>3</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
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**Other Required Coursework**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
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</tr>
<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>or T&amp;L 998</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 24-37

Master of Education (M.Ed.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Teacher Licensure
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Refer to the Admissions section of the graduate catalog for additional information on admission requirements and application procedures.

Degree Requirements

Licensed persons are eligible for the Master of Education degree. The major portion of the program includes coursework that addresses practical aspects of teaching at the elementary school level—literacy development, mathematics, science, social studies, curriculum development, and working with families. Available courses focus on the relationship between theories of child development and educational practices designed to foster that development. The program culminates in a final paper, project, or thesis.

Non-Thesis Option:

1. Thirty-two (32) credits including credits required for the major.
2. A minimum of three credits of Independent Study
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.

Thesis Option:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

Required Courses for the Master of Education

Major: Elementary Education

Required Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 518</td>
<td>Science in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 519</td>
<td>Social Studies in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 522</td>
<td>Mathematics in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 580</td>
<td>Practicum in Schools</td>
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</table>

Cognate

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>T&amp;L 569</td>
<td>Action Research (Recommended)</td>
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Elective

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 568</td>
<td>Practicum in Schools</td>
<td>1</td>
</tr>
</tbody>
</table>

Foundations

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR Elective</td>
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<td>3</td>
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</table>

Other Required Coursework

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
<td>2-6</td>
</tr>
<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>or T&amp;L 998</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

Electives

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 580</td>
<td>Practicum in Schools</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credits: 30-37

English Language Learners (TESOL)

http://education.und.edu/teaching-and-learning/ell/grad-ell.cfm

FACULTY: Shafer (Graduate Director) and Walker

Degree Granted: Master of Education (M.Ed.)

The Graduate Certificate in ELL Education and the M.Ed. in ELL Education are designed to provide licensed teachers and other professionals with in-depth and specialized knowledge in teaching K-12 and adult English language learners in the U.S. and abroad. Both programs are offered on-line; on-campus options are also available. Both programs require a field experience. Note: K-12 licensure is not required for admission; however, these programs do not lead to initial teacher licensure, which is required for North Dakota ELL teacher endorsement. Educators from other states seeking ELL teacher endorsement should check to determine whether the Graduate Certificate program or the Master’s degree program best meets their state requirements.

A variety of federal financial aid programs, including TEACH grants, are available for candidates who plan to work as ELL teachers in high needs schools in the United States.

Master of Education in ELL Education (M.Ed.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. An undergraduate degree in education, or a related field.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A = 4.00).
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. Students currently enrolled in UND’s Graduate Certificate in ELL Program who want to transfer to the M.Ed. in ELL Education program must apply for admission to the M.Ed. program. Students who have completed the Graduate Certificate have two years from the date of certificate completion to be apply and be accepted into the M.Ed. program and have their certificate courses credited towards the M.Ed. degree.

Degree Requirements

1. Thirty-five (35) credits including a minimum of twelve in the major, six in a cognate area, and six in foundations.
2. A minimum of two credits of Independent Study or Scholarly Project.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study or scholarly project approved by the faculty advisor.
6. Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 523</td>
<td>Literacy Instruction for English Language Learners</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 514</td>
<td>Introduction to Multilingual Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 537</td>
<td>ELL Methods and Materials</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 550</td>
<td>Assessment and Evaluation in ELL Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 568</td>
<td>Research and Advocacy in TESOL</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 580</td>
<td>Practicum in Schools</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
<td>2</td>
</tr>
</tbody>
</table>
Higher Education

http://education.und.edu/educational-leadership/higher-education.cfm

FACULTY: Healy, Nguyen, and Worley (Graduate Director)

Degrees Granted: Master of Science (M.S.), Doctor of Education (Ed.D.) and Doctor of Philosophy (Ph.D.)

This major incorporates the examination of the governance, organization, and administration of colleges and universities; internal and external factors leading to student access, development, and success; evaluation and assessment of students, programs, institutions, and systems; and ethical and historical implications of the higher education enterprise.

Mission Statement

The academic mission is to prepare and support students through a community of diverse learners in their development as scholar-practitioners, who seek positions in postsecondary educational organizations or governmental agencies. Accordingly, the proposed graduate studies in Higher Education will enable students to engage actively in the critical reflection and ethical decision-making about current issues and problems in higher education. To achieve those learning experiences, the faculty have identified three learning goals and several corresponding learning objectives for students of this major.

Program Goals

Learning Goal 1: Students will display intellectual and professional curiosity in pursuit of knowledge and learning. Accordingly, students will be able to:

- articulate a general understanding of higher education as a field of study.
- develop, deliver, and assess courses and educational programs that are grounded in current research and best practice on learning, course and program design, and assessment.
- design and/or modify academic and co-curricular programs and policies to respond to the differences in student characteristics and developmental needs.
- demonstrate the basic leadership skills of developing a vision, engaging others in the vision, and executing a plan to achieve the vision.

Learning Goal 2: Students will communicate in both written and oral presentation form with a scholar-practitioner frame. Accordingly, students will be able to:

- demonstrate sound research design and familiarity with quantitative and qualitative methodologies.
- integrate information, theory and research with the student’s own perspective and voice.
- apply theory to practice in order to demonstrate how organizations, culture and environment influence and shape student behavior.
- analyze a situation, identify the key players and decision-makers, develop networks of support, and prepare compelling and convincing arguments.

Learning Goal 3: Students will demonstrate capacity to express multiple perspectives and values among multiple constituents so they may maneuver through the enterprise, profession, and individual pursuits. Accordingly, students will be able to:

- define the philosophical and historical context of current issues and problems in higher education.
- identify and understand cultural elements and artifacts for students, faculty, administrators, and policy-makers and how they impact the higher education experience.
- demonstrate a commitment to diversity and social justice by understanding the backgrounds and histories of individuals.
- promote multicultural competence in students, faculty, staff, administrators, and policy-makers.

Master of Science (MS)

Admission Requirements

1. A bachelor’s degree from an accredited college or university.
2. A cumulative undergraduate GPA of 2.75 or at least 3.00 for the last two years. Typically, applicants with teaching experience in schools apply to the M.Ed. program, not the M.S. program.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the Graduate Catalog.
4. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
5. All applicants are required to respond to essay questions provided in the application, submit a resume and writing sample.

Degree Requirements

1. A bachelor’s degree from an accredited college or university.
2. A cumulative undergraduate GPA of 2.75 or at least 3.00 for the last two years. Typically, applicants with teaching experience in schools apply to the M.Ed. program, not the M.S. program.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the Graduate Catalog.
4. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
5. All applicants are required to respond to essay questions provided in the application, submit a resume and writing sample.

Required Courses:

Core Courses/Experiences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HE 500</td>
<td>Higher Education Orientation</td>
<td>1</td>
</tr>
<tr>
<td>HE 501</td>
<td>Introduction to Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 503</td>
<td>Diversity Across Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 505</td>
<td>The College Student</td>
<td>3</td>
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Educational Foundations & Research:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 541</td>
<td>History of Higher Education in the United States</td>
<td>3</td>
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</table>

Integrative Learning Experiences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HE 529</td>
<td>Capstone Seminar</td>
<td>1</td>
</tr>
<tr>
<td>HE 997</td>
<td>Independent Study</td>
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Electives (Sampling of Potential Electives):

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE 507</td>
<td>Collegiate Environments</td>
<td>3</td>
</tr>
<tr>
<td>HE 509</td>
<td>Higher Education Management</td>
<td>3</td>
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</table>
Doctor of Education (EdD)

Admission Requirements

The following criteria will be used to assess a student’s application for admission into the doctoral programs in the Department of Educational Leadership. No single criterion can adequately predict a student’s probable success in graduate work; as such, candidates for admission to the doctoral programs are evaluated on the following criteria:

1. A bachelor’s degree from an accredited college or university.
2. Completion of a master’s degree from an accredited college or university.
3. Grade point average from all previous graduate work (minimum of 3.5 required)
4. Professional resume
5. Educational leadership essay
6. Statement of professional goals
7. Writing sample
8. Three (3) letters of recommendation
9. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section.
10. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Degree Requirements

Students seeking the Doctor of Education degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Educational Leadership Department.

The Ed.D. program in Higher Education is designed primarily for practitioners preparing for college and university administration positions.

1. A minimum of 96 semester credit hours of course work beyond the bachelor’s degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
4. With approval of a student’s Faculty Advisory Committee, up to 30 credits from a master’s degree may be transferred from another institution.
5. Successful completion of comprehensive examinations in Educational Leadership and Educational Foundations and Research.
6. Successful completion of a final examination.

Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Minor/Master's transfer credits (30 credits)</td>
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<tr>
<td>Higher Education Common Core (18 credits):</td>
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<tr>
<td>HE 530</td>
<td>Orientation to Doctoral Study</td>
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<tr>
<td>HE 532</td>
<td>Principles and Practices in Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 536</td>
<td>Leading and Learning in Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 538</td>
<td>College Student Experiences</td>
<td>3</td>
</tr>
<tr>
<td>HE 549</td>
<td>Dissertation Orientation</td>
<td>2</td>
</tr>
</tbody>
</table>

T&L 541 History of Higher Education in the United States 3
T&L 543 Scholarly Writing 3

Educational Foundations (12 credits):
- Advanced Foundations elective 1 3
- Advanced Foundations elective 2 3
- Advanced Foundations elective 3 3
- Advanced Foundations elective 4 3

Scholarly Tools (6 credits):
- (Prerequisite: EFR 515 or equivalent)
  - EFR 510 Qualitative Research Methods 3
  - EFR 516 Statistics II 3

Administration Emphasis (20 credits):
- Core (9 credits):
  - HE 563 Academic Administration in Higher Education 3
  - HE 570 Higher Education Law 3
  - HE 576 Higher Education Planning and Finance 3
- Electives (11 credits):
  - Selected with consent of advisor 11

Individualized Emphasis (20 credits):
- Electives selected with consent of advisor and faculty from area of specialization 20
- Dissertation 10

Total Credits 35-42

Doctor of Philosophy (PhD)

Admission Requirements

The following criteria will be used to assess a student’s application for admission into the doctoral programs in the Department of Educational Leadership. No single criterion can adequately predict a student’s probable success in graduate work; as such, candidates for admission to the doctoral programs are evaluated on the following criteria:

1. Completion of a master’s degree from an accredited college or university.
2. Grade point average from all previous graduate work (minimum of 3.5 required)
3. Professional resume
4. Educational leadership essay
5. Statement of professional goals
6. Writing sample
7. Three (3) letters of recommendation
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
9. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Educational Leadership Department.

The Ph.D. program in Higher Education is designed for students preparing for positions in which research and creative experience are predominant interests. Ph.D. candidates are expected to have undertaken and completed independent research leading to an original contribution of knowledge in the field. It is generally expected that the Ph.D. dissertation will be publishable. This degree option typically provides preparation for those who aspire to leadership.
principles and practices in higher education, in government agencies, or in other educational policy organizations.

1. A minimum of 90 semester credit hours of course work beyond the bachelor’s degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.
4. With approval of a student’s Faculty Advisory Committee, up to 30 credits from a master’s degree may be transferred from another institution.
5. Successful completion of comprehensive examinations in Educational Leadership and Educational Foundations and Research.
6. Successful completion of a final examination.

Minor/Master’s transfer credits (24 credits) 24

<table>
<thead>
<tr>
<th>Higher Education Common Core (18 credits):</th>
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</thead>
<tbody>
<tr>
<td>HE 530 Orientation to Doctoral Study</td>
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</tr>
<tr>
<td>HE 532 Principles and Practices in Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 536 Leading and Learning in Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HE 538 College Student Experiences</td>
<td>3</td>
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<tr>
<td>HE 549 Dissertation Orientation</td>
<td>2</td>
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<tr>
<td>T&amp;L 541 History of Higher Education in the United States</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 543 Scholarly Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

Educational Foundations (6 credits):  
(Prerequisite: EFR 500 or equivalent)

| Advanced Foundations elective 1 | 3 |
| Advanced Foundations elective 2 | 3 |

Scholarly Tools (12 credits):  
(Prerequisite: EFR 515 or equivalent)

| EFR 510 Qualitative Research Methods      | 3 |
| EFR 516 Statistics II                     | 3 |
| Advanced Scholarly Tool elective 1        | 3 |
| Advanced Scholarly Tool elective 2        | 3 |

Administration emphasis (18 credits):  
Core (9 credits):

| HE 563 Academic Administration in Higher Education | 3 |
| HE 570 Higher Education Law                     | 3 |
| HE 576 Higher Education Planning and Finance     | 3 |

Electives (9 credits):

| Selected with consent of advisor              | 9 |

Individualized emphasis (18 credits):  
Electives selected with consent of advisor and faculty from area of specialization | 18 |

Dissertation | 12 |

Courses

HE 500. Higher Education Orientation. 1 Credit.  
This course provides an orientation to graduate masters education. S/U grading. On demand.

HE 501. Introduction to Higher Education. 3 Credits.  
An overview of administration of America’s colleges and universities. Topics include roles of state and federal government, governing boards, institutional organization and culture, types of institutions, faculty, students, research about higher education, and the profession of administrator. On demand.

HE 503. Diversity Across Higher Education. 3 Credits.  
The course intends to promote understanding of the diverse populations within higher education and to encourage students to examine their own attitudes regarding diversity and openness to other cultures. Examination of practice models for service delivery to diverse populations will help prepare students to develop management, leadership, and advocacy skills. The course will underscore the development of skills for working with individuals, small groups, and campus groups in relation to equity, diversity, and inclusion. On demand.

HE 505. The College Student. 3 Credits.  
This course will examine the theoretical perspectives that describe students’ growth throughout the late adolescent and adult life span. The course will look at theory in the areas of intellectual, moral, ego, psychosocial, career, and spiritual development. Further, the course will examine sources of identity including gender, race, culture, ethnicity, and sexual identity. On demand.

HE 507. Collegiate Environments. 3 Credits.  
The course will discuss how student characteristics influence student educational and development needs, and the effects of the college experience on student learning and development. This course will also examine college environments and how students’ person-environment interactions affect their development. On demand.

HE 509. Higher Education Management. 3 Credits.  
The course will examine the administrative functions of higher education including student affairs, academic affairs, institutional advancement, and administrative services. Students will be introduced to professional issues, ethics, standards of practice, and the legal environment. On demand.

HE 511. Program Development. 3 Credits.  
The course will examine the learning theories that undergird the design and delivery of educational programs and services. Students will acquire the knowledge and skills needed to conduct needs assessment and outcomes assessments in-person and mediated environments. They will also learn and demonstrate program planning, development and implementation process. On demand.

HE 513. College Students and the Law. 3 Credits.  
The course provides an overview of key legal issues that pertain to college students. Using a legal frame and analysis, the focus of the course surrounds administrative decision making, effective practices, and organizational policy design and implementation. On demand.

HE 529. Capstone Seminar. 1 Credit.  

HE 530. Orientation to Doctoral Study. 1 Credit.  
This course provides an orientation to doctoral study. S/U grading. On demand.

HE 532. Principles and Practices in Higher Education. 3 Credits.  
This course is designed for students newly admitted to the doctoral program in higher education. It introduces the students to the study of higher education enterprise in terms of its context, research, and practice. Among the topics covered, students in the course will explore the significance of institutional missions and purposes, federal and state governments, and the academic community. On demand.

HE 536. Leading and Learning in Higher Education. 3 Credits.  
Colleges and universities are complex organizations with a core purpose of learning. An understanding of organizations, what they are and how they function is critical to success as a higher education professional. Further, each member of the organization is called on to provide leadership for the organization in the classroom, the department, and other organizational units. Effective leaders will understand the organization and how their roles and work help support the institution’s effectiveness in educating students. On demand.

HE 538. College Student Experiences. 3 Credits.  
Given the growing awareness, economically, politically, and socially, of the need for students to succeed in college, faculty, staff, and administrators are increasingly being held accountable for college persistence and completion. A significant factor in students’ success is their learning and development. Students in this course will explore concepts and theories related to student learning and development and be challenged to interpret and apply theories to real-world higher education practice, considering how these processes influence student success. On demand.

HE 549. Dissertation Orientation. 2 Credits.  
This course introduces students to the dissertation process, focusing specifically on proposal formulation. S/U grading. On demand.
HE 561. Curriculum in Higher Education. 3 Credits.
A study of processes for planning, implementing, and evaluating curriculum within institutions of higher education. Topics will include historical perspectives on curriculum in higher education, governance systems related to curriculum development and adoption, and issues of current interest and concern. On demand.

HE 563. Academic Administration in Higher Education. 3 Credits.
The roles and responsibilities of academic administration in higher education. Topics include the major academic roles (chairperson, dean, chief academic officer), curriculum and instruction, program evaluation, assessment, planning, faculty workload and evaluation, and the profession of administrator. On demand.

HE 564. Higher Education Student and Support Services. 3 Credits.
An overview of the organization and functions of student and support services within institutions of higher education. Students will gain an understanding of the administrative issues related to career services, student counseling, enrollment services, student activities, health services, student organization, and other institutional units, which serve the needs of students at a college or university. On demand.

HE 569. Higher Education Diversity Systems and Policy. 3 Credits.
The course is designed to provide students with a critical understanding of issues of diversity in higher education from an institutional and systematic perspective. Multiple levels and dimensions of diversity will be discussed, including structural, institutional and systematic manifestations of how diversity and equity are historically and currently addressed. Institutional type and role will also be explored. On demand.

HE 570. Higher Education Law. 3 Credits.
An overview of the legal issues that confront college and university personnel. Pertinent federal and state statutes as well as case law will be used to instruct about legal rights and responsibilities of university/college administrators and students. The legal relationships between the institution and the faculty, the student, state government, and the federal government will be explored. On demand.

HE 573. Higher Education and Public Policy. 3 Credits.
The course addresses the development, analysis, and implementation of public policy in postsecondary education and the structures and actors involved in policy activity. The course will also introduce students to current and ongoing postsecondary public policy issues at the state, national, and international levels. On demand.

HE 576. Higher Education Planning and Finance. 3 Credits.
Higher education must plan to ensure the future of the institution and those plans guide the allocation of resources to accomplish the institutional mission and plan. This course will provide an overview of planning processes and the subsequent allocation of resources to implement the plan. Students will also learn about financial management including budgeting, financial policies and performance metrics. The college administrator’s role in guiding the fiscal welfare of an institution of higher education will be explored. On demand.

HE 579. Special Topics in Higher Education. 1-3 Credits.
Exploration of special topics in the study of education not regularly included in available course offerings. May be repeated for different topics. Prerequisite: Consent of instructor or advisor. Repeatable.

HE 591. Practicum in Higher Education. 1-4 Credits.
Students will complete projects to further student learning through course design, teaching, and assessment. Repeatable up to a maximum of 8 credits. Prerequisite: Consent of instructor. Repeatable to 8 credits. On demand.

HE 592. Internship in Higher Education. 1-8 Credits.
This is a professional practice experience in an administrative unit. May be repeated to a maximum of 8 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 8 credits. On demand.

HE 594. Readings in Higher Education. 1-4 Credits.
Designed primarily for advanced graduate students. May be repeated for different topics to a maximum of 9 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 9 credits. On demand.

HE 595. Higher Education Seminar. 1-9 Credits.
A seminar for advanced graduate students on a focused topic. Students will have significant responsibility for preparing and presenting papers and studies on the focus topic. May be repeated to a maximum of 9 credits. Prerequisites: Consent of the instructor and advisor. Repeatable to 9 credits. S/U grading. On demand.

HE 597. Administrative Project in Higher Education. 1-4 Credits.
For advanced graduate students. Students will undertake an assignment from an administrator for a project that will be implemented once it is completed. Repeatable to a maximum of 4 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 4 credits. On demand.

HE 598. Individual Research in Higher Education. 1-9 Credits.
Students design a research study, implement the research plan, and/or publish the results of the project. May be repeated to a maximum of 9 credits. Prerequisites: Consent of advisor and instructor. Repeatable to 9 credits.

HE 995. Scholarly Project. 2 Credits.
Prerequisite: Consent of advisor. On demand.

HE 996. Continuing Enrollment. 1-12 Credits.
Repeatable to a maximum of 48 credits. Prerequisite: Consent of the advisor. Repeatable. S/U grading.

HE 997. Independent Study. 2 Credits.
Prerequisite: Consent of the advisor.

HE 998. Thesis. 1-9 Credits.
Prerequisite: Consent of the advisor. Repeatable to 9 credits.

HE 999. Dissertation. 1-12 Credits.
Students work on the dissertation/doctoral capstone project. Prerequisite: Consent of the advisor. Repeatable to 12 credits. F,S,SS.

### Instructional Design and Technology

http://education.und.edu/teaching-and-learning/idt/

**FACULTY:** Borysewicz, Grabe, W. Hung (Graduate Director) and Van Eck

### Degrees Granted: Master of Science (M.S.), Master of Education (M.Ed.) and Graduate Certificates

The Instructional Design and Technology (IDT) program is a collaboration between the College of Education and Human Development, the College of Arts and Sciences, and the John D. Odegard School of Aerospace Sciences. The designers believe the program benefits from the expertise of a diverse faculty, the various resources of the different organizational units, and a collaborative decision-making structure among the three units. The IDT program is administered through the College of Education and Human Development (EHD) and follows the IDT, EHD, UND, UND School of Graduate Studies, and NDUS rules and policies. The IDT program currently offers a Master of Science, a Master of Education, a Certificate in K-12 Technology Integration, a Certificate in Closed Captioning and Assistive Technology, and a Certificate in Corporate Training and Performance. IDT also offers a doctorate through the Teaching and Learning Ph.D. program, in which IDT is an area of emphasis (see Teaching and Learning in the graduate catalog).

The IDT master’s and certificate programs are available for on-campus and distance delivery, making it possible to attain these degrees via distance delivery, on-campus attendance, or a combination of both. Online students and on-campus students are peers in the same class sessions and experience the same educational opportunities. Courses typically have a few synchronous (live) class sessions, where students may attend on-campus in the actual classroom or they may participate through our distance delivery system. In this manner, class lectures, discussion, presentation, and collaboration are done seamlessly, in a nearly identical fashion to traditional classes.

Asynchronous sessions (those done at the time and place of the students’ choosing each week) are handled through a course management system. Students use these tools to read material loaded by the teacher, turn in assignments, communicate through message boards, participate in discussions through threaded discussion tools, take tests, and receive their grades. There are assignments and participation activities every week, whether the class meets live or not. In this way, students get the best of both worlds: the flexibility of online learning and the personal contact and connection of face-to-face instruction.
Details pertaining to admission and degree requirements can be found in the Degrees section.

Master of Science (MS)

Mission Statement and Program Goals

The primary mission of the Instructional Design and Technology (IDT) program is to prepare graduates for service in education, business, government, and industry who will enhance instruction and learning through the use of instructional design and technology. Graduates will be able to design curriculum, training, and human performance solutions using any medium and for any subject area, environment, or learner. Graduates of the doctoral program will be qualified to work as university faculty in IDT.

The Master of Science (MS) degree is primarily intended for students who plan to work in business, government, and industry developing and delivering technologically supported curriculum and/or solving human performance problems. This degree is available in two tracks. The MS (thesis option) is intended for those students who want to develop and utilize research skills, (e.g., for work in academic environments where research is encouraged). The MS (scholarly project option) is intended for those students who prefer to emphasize the development and evaluation of instructional materials.

Master of Education (MEd)

Mission Statement and Program Goals

The primary mission of the IDT program is to prepare graduates for service in education, business, government, and industry who will enhance instruction and learning through the use of IDT. These graduates will be able to design curriculum, training, and human performance solutions using any medium, and for any subject area, environment, or learner.

The Master of Education (MEd) degree is primarily intended for students who plan to work in an education environment, including K-12 schools and higher education. Individuals pursuing this degree will work primarily as technology facilitators or curriculum design specialists. As technology facilitators, they are likely to work with instructors in assisting them to appropriately, effectively, and successfully integrate technology into their instruction. They are also likely to do some direct work with students in teaching skills associated with technology integration. As curriculum design specialists, they are likely to work at the school, district, or state levels to design curriculum for public education. Students pursuing this degree will learn the theoretical issues associated with technologically supported instruction but their emphasis will be in the application of this knowledge in terms of best practices. A scholarly project is required and is considered a capstone experience. The scholarly project must address a real-world, practical instructional design learning or performance problem and fully employ an instructional design or human performance technology model to the solution of that problem or address a theoretical construct in the same way that a thesis does.

Master of Science (MS)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. An overall undergraduate grade point average of 2.75 or a junior/senior year grade point average of 3.00 for the Master of Education and Master of Science degrees, and for the certificate programs.
2. A 3.5 or better grade point average for all graduate work.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. Two essay questions as part of the application process.

Provisional admission may be considered for students whose academic performance does not meet these criteria. Whether such consideration is given will depend on the circumstances and the judgment of the admissions faculty.

Degree Requirements

Students seeking the MS degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the IDT program.

1. At least one-half of the credits must be at or above the 500 level.
2. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

Required Courses

| Core coursework in IDT | IDT 500 | Survey of Instructional Design | 3 |
| Additional coursework in IDT area of emphasis | IDT 520 | Instructional Systems Analysis and Design | 3 |
| Foundations coursework in education or psychology | IDT 525 | Development, Implementation, and Evaluation of Instructional Materials | 3 |
| Scholarly tools/research | Electives | 6 |
| Internship | 2 |
| Scholarly project or thesis | 2-4 |

Total (34-non-thesis or 36-thesis)

The IDT degree options are based on the same set of program components:

1. Program core component: New courses presenting IDT content.
2. Research component: Development of research skills.
4. Area of Emphasis in IDT: Opportunity for area or skill specialization within IDT.

The IDT course requirements are organized within a major, foundations area, research/scholarly tools area, and area of emphasis. The major consists of the IDT core and the area of emphasis in IDT. Students in the MS degree program will be required to complete 18 credit hours of coursework in IDT subject matter. This requirement includes:

Core Coursework

| IDT 550 | Theories and Models of Instructional Design |
| IDT 590 | Special Topics in Instructional Design and Technology |
| IDT 591 | Readings in Instructional Design and Technology |
| IDT 592 | Research in Instructional Design and Technology (MS must take scholarly tool, does not count toward cognate) |
| IDT 593 | Directed Studies in Instructional Design and Technology |

Area of Emphasis

Select three of the following: 9

1. K-12 Emphasis
   - IDT 510 Technology-Based Instruction: Applications and Methods
   - IDT 540 Digital Media and the Internet in Schools
   - Corporate Emphasis
   - IDT 560 Instructional Design Consulting
   - IDT 570 Human Performance Technology
   - Computer- and Web-Based Instruction
   - IDT 530 Introduction to Computer-Based Instruction
   - IDT 535 Advanced Computer-Based Instructional Development
   - IDT 545 Instructional Simulations and Games
   - IDT 580 Introduction to Web-Based Instruction

2. Foundations
   - Any EFR Foundations course 3

3. Scholarly Tools
   - IDT 590 Special Topics in Instructional Design and Technology 3

4. Internship
   - IDT 593 Directed Studies in Instructional Design and Technology 1-3
Master of Education (MEd)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. An overall undergraduate grade point average of 2.75 or a junior/senior year grade point average of 3.00 for the Master of Education and Master of Science degrees, and for the certificate programs.
2. A 3.5 or better grade point average for all graduate work.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section of the graduate catalog.
4. Two essay questions as part of the application process.

Provisional admission may be considered for students whose academic performance does not meet these criteria. Whether such consideration is given will depend on the circumstances and the judgment of the admissions faculty.

A basic knowledge of the microcomputer and substantial skill in using standard applications to produce work products (word processing, spreadsheet, drawing/painting, graphing, and other common applications).

Degree Requirements

Students seeking the MEd degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the IDT program.

1. At least one-half of the credits must be at or above the 500 level.
2. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

Required Courses

Core coursework in IDT 9
Additional coursework in IDT area of emphasis 6
Foundations coursework in education and psychology 6
Scholarly tools/research 3
Electives 6
Internship 2
Scholarly Project/Independent Study 2

Total Credits 34

The IDT degree options are based on the same set of program components:

1. Program core component: New courses presenting IDT content.
2. Research component: Development of research skills.
4. Area of Emphasis in IDT: Opportunity for area or skill specialization within IDT.

The IDT course requirements are organized within a major, foundations area, research/scholarly tools area, and area of emphasis. The major consists of the IDT core and the area of emphasis in IDT. Students in the MEd degree program will be required to complete 15 credit hours of coursework in IDT subject matter. This requirement includes:

Core Coursework

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 500</td>
<td>Survey of Instructional Design</td>
<td>3</td>
</tr>
<tr>
<td>IDT 520</td>
<td>Instructional Systems Analysis and Design</td>
<td>3</td>
</tr>
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</table>

Area of Emphasis

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 590</td>
<td>Special Topics in Instructional Design and Technology</td>
<td>6</td>
</tr>
<tr>
<td>IDT 591</td>
<td>Readings in Instructional Design and Technology</td>
<td>3</td>
</tr>
<tr>
<td>IDT 592</td>
<td>Research in Instructional Design and Technology</td>
<td>3</td>
</tr>
<tr>
<td>IDT 593</td>
<td>Directed Studies in Instructional Design and Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

Corporate Emphasis

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 510</td>
<td>Technology-Based Instruction: Applications and Methods</td>
<td>3</td>
</tr>
<tr>
<td>IDT 540</td>
<td>Digital Media and the Internet in Schools</td>
<td>3</td>
</tr>
</tbody>
</table>

Scholarly Tools

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
</tbody>
</table>

Internship

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 584</td>
<td>Internship in Instructional Design and Technology</td>
<td>2-4</td>
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</tbody>
</table>

Scholarly Project

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>IDT 995</td>
<td>Scholarly Project</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credits 30-32

Degree Delivery Options

The IDT master’s and certificate programs are available for on-campus and distance delivery, making it possible to attain these degrees via distance delivery, on-campus attendance, or a combination of both. Online students and on-campus students are peers in the same class sessions and experience the same educational opportunities. Courses typically have a few synchronous (live) class sessions, where students may attend on-campus in the actual classroom or they may participate through our distance delivery system. In this manner, class lectures, discussion, presentation, and collaboration are done seamlessly, in a nearly identical fashion to traditional classes.

Asynchronous sessions (those done at the time and place of the students’ choosing each week) are handled through a course management system. Students use these tools to read material loaded by the teacher, turn in assignments, communicate through message boards, participate in discussions through threaded discussion tools, take tests, and receive their grades. There are assignments and participation activities every week, whether the class meets live or not. In this way, students get the best of both worlds: the flexibility of online learning and the personal contact and connection of face-to-face instruction.

PhD Area of Emphasis in IDT

IDT also offers a doctorate through the Teaching and Learning PhD program, in which IDT is an area of emphasis. For details on this option, see the Teaching and Learning PhD (p. 434) program section in the graduate catalog.

IDT Certificate Programs

IDT offers three 12-credit certificates. The certificates provide minimum competencies in the field of instructional design within a given subset of the field (technology integration, corporate training, or eLearning). Certificates are intended for those already working in some capacity as an instructional designer but who lack an advanced degree in instructional design. Those seeking the full set of professional competencies of an instructional designer
across all areas in preparation for entering the field of instructional design are encouraged to apply to one of the IDT master’s programs instead. Courses taken for a certificate may also be transferred into any of the IDT master’s programs at a later date.

**IDT Certificate in K-12 Technology Integration**

**Required Courses (6 credits):**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

**Two Additional Courses from the Following (6 credits):**
- IDT 510 Technology-Based Instruction: Applications and Methods 3
- IDT 540 Digital Media and the Internet in Schools 3
- IDT 545 Instructional Simulations and Games 3

**Total credits 12**

**IDT Certificate in eLearning**

**Required Courses (6 credits):**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

**Two Additional Courses from the Following (6 credits):**
- IDT 530 Introduction to Computer-Based Instruction 3
- IDT 545 Instructional Simulations and Games 3
- IDT 580 Introduction to Web-Based Instruction 3

**Total credits 12**

**IDT Certificate in Corporate Training and Performance**

**Required Courses (6 credits):**
- IDT 520 Instructional Systems Analysis and Design 3
- IDT 525 Development, Implementation, and Evaluation of Instructional Materials 3

**Two Additional Courses from the Following (6 credits):**
- IDT 545 Instructional Simulations and Games 3
- IDT 560 Instructional Design Consulting 3
- IDT 570 Human Performance Technology 3

**Total credits 12**

**Courses**

**IDT 500. Survey of Instructional Design. 3 Credits.**
This course provides students with an in-depth overview of the field of Instructional Technology. Topics include the history and critical issues of the field; a description of instructional design; applications of instructional technology, and associated areas of research.

**IDT 510. Technology-Based Instruction: Applications and Methods. 3 Credits.**
A study of the various methods for using technology to deliver and/or support instruction: tutorials, drills, simulation, interactive video, instructional games, intelligent computer-based instruction, performance support systems, job aids, testing, distance learning, intelligent tutoring systems, and instructional management systems.

**IDT 520. Instructional Systems Analysis and Design. 3 Credits.**
The first course in a two-course required sequence. IDT 520 is a study of methodologies for analyzing and designing instruction. Topics include needs analysis, job/task analysis, and assessment of instructional outcomes. IDT 525 is the second required course in this two-course sequence.

**IDT 525. Development, Implementation, and Evaluation of Instructional Materials. 3 Credits.**
This course focuses on the development, implementation, and evaluation of instructional materials that have been created according to instructional design principles. The second course in a two-course sequence, this course completes the instructional design process begun in IDT 520. After completing this two-course sequence, students will have the skills needed to conduct the full instructional design process in a variety of settings, and with a variety of learners, odalities, and domains. Prerequisites: Program major or permission of instructor; IDT 520.

**IDT 530. Introduction to Computer-Based Instruction. 3 Credits.**
An examination of the technology (hardware and software) for developing and delivering computer-based instruction (CBI). A study of the characteristics of high-quality CBI, addressing such topics as program structure, user interface, navigation, message/screen design, use of graphics, response analysis, feedback strategies, error checking, branching, and computer-managed instruction. Prerequisite: IDT 520.

**IDT 535. Advanced Computer-Based Instructional Development. 3 Credits.**
This course is designed to extend the CBT/CBI design and development skills acquired in IDT 530. Students will study advanced CBT/CBI techniques and applications such as artificial intelligence, intelligent tutoring systems, electronic performance support systems, authoring tools, learning objects, pedagogical agents, SCORM compliant programming, simulations and games, the use of CBT/CBI for research purposes, and learning management systems (LMS). In addition to studying these areas, students will build a CBT/CBI unit that implements one or more of these applications. Prerequisites: Program Major; IDT 530.

**IDT 540. Digital Media and the Internet in Schools. 3 Credits.**
This course builds on the theories and approaches to technology integration first introduced in IDT 510. Students will gain practice developing lesson plans and examples of student artifacts with specific media such as digital video, digital audio, digital photography, and the Internet. Students will gain competency in generating and using media according to the principles of technology integration, rather than technology use. Prerequisites: IDT 510 and IDT 520.

**IDT 545. Instructional Simulations and Games. 3 Credits.**
This course provides an in-depth study of the theoretical, philosophical, and practical issues surrounding the use of simulations and games in learning environments. Methods and approaches for integrating commercial games into learning environments and for developing new simulations and games around content will be examined. Prerequisite: Program major or permission of instructor.

**IDT 549. Graduate Seminar in Instructional Design and Technology. 3 Credits.**
Seminar on critical reading and writing related to scholarship in the field of Instructional Design and Technology. Prerequisite: Program major or permission of instructor.

**IDT 550. Theories and Models of Instructional Design. 3 Credits.**
This course focuses on pedagogical theories from education and psychology as they relate to instructional design, and on alternate models of instructional design. Topics include epistemological views of knowledge, major schools of thought on the nature of learning, a survey of instructional and learning theories, and a survey of instructional design models. Particular emphasis is placed on the interrelation of theories, models, and practice in the field of instructional design. Prerequisite: Program major or permission of instructor.

**IDT 560. Instructional Design Consulting. 3 Credits.**
This course trains students in the theoretical, (e.g., needs analysis, change agency, data-driven decisions, solution specification) and practical (e.g., management of client relationship, project management skills, budgeting) of instructional design consulting. Role-play, response to an RFP, and discussion of modern approaches to managing the consulting process will be primary activities in this course. Prerequisites: Program major or permission of instructor; IDT 520.

**IDT 570. Human Performance Technology. 3 Credits.**
An overview of the Human Performance Improvement (HPI) and Human Performance Technology (HPT) models and processes. Particular emphasis on determining whether instructional interventions or performance improvement interventions are called for, models and techniques for identifying performance gaps, specifying solutions, measuring results, and managing or adjusting the improvement. Job aids, electronic performance support systems, authoring tools, and other performance technologies will be covered. Prerequisites: IDT 500 and IDT 520.
on campus.
The degrees are offered in two formats: online or a combination of online and systematic reflection on their practice to advance literacy achievements for all learners, use effective instructional practice and assessment, understand methods to assess, diagnose, and evaluate readers and writers, and use systematic study of practice to lead positive changes in literacy teaching and learning.

Master of Science (M.S.)

Mission Statement and Program Goals

The Master of Science, Reading Education program prepares literacy specialists and classroom teachers in reading/language arts and leadership. Graduates possess specialized knowledge about how to work with readers who have diverse needs. Systematic reflection on instruction and assessment practice that promotes reading development for all learners is emphasized. Students in the program will:

- Learn to use foundations of literacy to teach diverse learners in a variety of settings.
- Gain knowledge of literacy curriculum that is learner and literature based.
- Learn to use constructivist assessments and instructional practices in a variety of literacy learning settings, e.g., Title I classroom.
- Understand methods to assess, diagnose, and evaluate readers and writers.
- Use systematic study of practice to lead positive changes in literacy teaching and learning.

Master of Education (M.Ed.)

Mission Statement and Program Goals

The Master of Education, Reading Education program prepares teachers in reading/language arts. Graduates are equipped to become life-long learners in the field of literacy education, understand and respect diverse readers, promote the learning of all students, use effective instructional practice and assessment, and systematically reflect on their practice to advance literacy achievements for their students. Students in the program will:

- Learn to use foundations of literacy to teach diverse learners in the classroom.
- Gain knowledge of literacy curriculum that is learner and literature based.
- Learn to use constructivist assessment and instructional practices in the classroom.
- View professional development in literacy education as a career-long responsibility of the classroom teacher.

Master of Science (M.S.)

Admission Requirements

For the M.S., teacher licensure at one of the following levels: early childhood, elementary, middle or secondary education.

The Reading Education program follows the School of Graduate Studies requirements for a cumulative undergraduate minimum grade point average of 2.75 or a junior/senior year minimum grade point average of 3.00. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section of the graduate catalog. Transcripts, recommendations, and a personal statement, i.e., a response to three essay prompts, are part of the School of Graduate Studies and Reading Education application procedure. The personal statement essay should be three pages in length and the prompts are:

1. Describe your professional background, especially as it relates to teaching reading, writing and other areas of reading/language arts.
2. What characteristics and strengths do you possess that make you a good candidate for this degree program?
3. Discuss your professional goals.

Refer to the School of Graduate Studies Admissions and the Education Admissions Process sections of the graduate catalog for additional information on degree and application requirements and procedures.

Degree Requirements

1. Core Requirements for the Reading Education major and literacy education electives: The courses in the major engage students in learning content about diverse readers, writers, and speakers; curriculum, methods of teaching and assessing; literacy theory and foundations; and professional perspective. T&L 583 Reading Clinic, one of the Core Requirements,
involves students in a practicum experience in which they work with readers to apply their core knowledge about teaching literacy to diverse readers.

2. Research: This component of the program supports development of skills for scholarly inquiry and systematic study of one’s own practice; learning about scholarly inquiry is integrated throughout the coursework.

The credit hours for the M.S., Reading Education may consist of:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524 Reading in the Content Areas</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525 Writing in the Classroom</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530 Foundations of Reading Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534 Basic Reading Diagnosis and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 536 Teaching Language Arts</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 583 Reading Clinic</td>
<td>2</td>
</tr>
</tbody>
</table>

Select up to three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 528 Children's Literature in the Classroom</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 531 Early Literacy Development and Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 532 Leadership in Literacy</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 995 Scholarly Project</td>
<td>2</td>
</tr>
<tr>
<td>or T&amp;L 997 Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>or T&amp;L 998 Thesis</td>
<td>2</td>
</tr>
</tbody>
</table>

Scholarly Tools

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 569 Action Research</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 579 Classroom Based Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>SPED 557 Progress Monitoring/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>EFR 509 Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>EFR 515 Statistics I</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 32

Master of Education (M.Ed.)

Admission Requirements

For the M.Ed., teacher licensure at one of the following levels: early childhood, elementary, middle or secondary education, or a baccalaureate degree in another field of study is required.

The Reading Education program follows the School of Graduate Studies requirements for a cumulative undergraduate minimum grade point average of 2.75 or a junior/senior year minimum grade point average of 3.00. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section of the catalog. Transcripts, recommendations, and a personal statement, i.e., a response to three essay prompts, are part of the School of Graduate Studies and Reading Education application procedure. The personal statement essay should be three pages in length and the prompts are:

1. Describe your professional background, especially as it relates to teaching reading, writing and other areas of reading/language arts.
2. What characteristics and strengths do you possess that make you a good candidate for this degree program?
3. Discuss your professional goals.

Refer to the School of Graduate Studies Admissions and the Education Admissions Process sections of the graduate catalog for additional information on degree and application requirements and procedures.

Degree Requirements

The M.Ed. degree requirements are based on the following components:

1. Core Requirements for the Reading Education major and literacy education electives: The courses in the major engage students in learning content about diverse readers, writers, and speakers; curriculum, methods of teaching and assessing; literacy theory and foundations; and professional perspective. T&L 583 Reading Clinic, one of the Core Requirements, involves students in a practicum experience in which they work with readers to apply their core knowledge about teaching literacy to diverse readers.
2. Cognate: Cognate courses are a selection of courses providing broad support to the major.
3. Foundations: Foundations content supports exploration of progressive education, issues in education, the field of literacy, and affirmation of diversity.

The M.Ed. Reading Education degree program requires coursework in three areas: The major (reading education), cognate, i.e., coursework that supplements the major, and foundations of education. The program culminates in T&L 995 Scholarly Project or T&L 997 Independent Study. With careful planning, most students can meet the course requirements for the North Dakota Reading Credential.

The credit hours for the M.Ed., Reading Education consist of:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524 Reading in the Content Areas</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525 Writing in the Classroom</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530 Foundations of Reading Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534 Basic Reading Diagnosis and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 536 Teaching Language Arts</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 583 Reading Clinic (corequisite with T&amp;L 534)</td>
<td>2</td>
</tr>
</tbody>
</table>

Select up to three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 528 Children's Literature in the Classroom</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 531 Early Literacy Development and Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 532 Leadership in Literacy</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 995 Scholarly Project</td>
<td>2</td>
</tr>
<tr>
<td>or T&amp;L 997 Independent Study</td>
<td>2</td>
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</table>

Cognate

Sample choices:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>T&amp;L 569 Action Research</td>
<td>3</td>
</tr>
<tr>
<td>SPED 552 Inclusive Methods</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 540 Theory and Philosophies of Curriculum in Schools</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 577 Assessment of Learning</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 518 Science in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 519 Social Studies in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 522 Mathematics in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 526 Play in Development and Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 529 Language Development &amp; Cognition in Children</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 553 Collaborative Relationships: Home, School and Community</td>
<td>3</td>
</tr>
</tbody>
</table>

Other courses are suited to the cognate to this area, e.g., English Language Learner courses; courses outside of the department and college may also be acceptable; consult with your advisor.

Educational Foundations

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 500 Introduction to the Foundations of Education</td>
<td>3</td>
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</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EFR 506 Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 501 Psychological Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 502 Issues and Trends in Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 503 Historical Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 504 Philosophical Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 505 Sociological Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 507 Gender, Sexuality and Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 508 Anthropological Foundations of Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 32

Special Education

http://education.und.edu/teaching-and-learning/special-education/index.cfm

FACULTY: Bjorg, Campoverde, Chiasson, Deaver, Grave, Griffin, Hoffer, Houghton, Jacobson, Johnson, Mahar, and Terras
Degrees Granted: Master of Science (M.S.) and Master of Education (M.Ed.)

The Special Education Program offers graduate coursework leading to a Master of Science or Master of Education degree in Special Education in the specialization areas of: Intellectual Disabilities; Early Childhood Special Education; Emotional Disturbance; Learning Disabilities; Strategist; Visual Impairment; and a certificate in Autism Spectrum Disorder. The program also offers the Board Certified Behavior Analyst sequence of courses and intensive practicum. Certified teachers with a bachelor’s degree in education may pursue either the Master of Education or the Master of Science. Non-certified individuals who have earned a bachelor’s degree in a field of study other than education may only pursue the Master of Science. The Master of Science degree has an assessment and scholarly writing focus, whereas the Master of Education has a focus on the foundations of education.

The Special Education programs are designed for educators or other professionals interested in the study of children, adolescents, and/or adults with disabilities. Certified teachers with a bachelor's degree in any area of education may pursue either the Master of Education or the Master of Science in any of the specialization areas. The Master of Education degrees have a foundation of education focus, whereas the Master of Science degrees have an assessment and research focus. Non-certified individuals who have earned a bachelor’s degree in a field of study other than education may only pursue the Master of Science. The Special Education programs are administered through the Department of Teaching and Learning in the College of Education and Human Development (EHD) and the UND School of Graduate Studies.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Mission, Vision and Program Goals

Mission
The Special Education Program at the University of North Dakota works to support all individuals; birth throughout their lifespan and their families through professional excel and advocacy.

Vision
The Special Education Program faculty and staff collaborate with others to ensure that everyone is valued and empowered in all aspects of their lives. We as a program, aspire to be globally renowned for its expertise, leadership, diversity, and high quality teacher and professional preparation in the fields of special education and behavior analysis.

Program Goals
The Special Education Program prepares individuals to have the knowledge, skills, and expertise to:

- Recognize the dignity and worth of all individuals.
- Understand social justice, inclusiveness, and diversity.
- Demonstrate professional excellence, integrity, and accountability.
- Provide rich and meaningful participation in society for individuals with exceptionalities.
- Develop and implement effective individualized education for individuals with exceptionalities.
- Recognize the importance of families in the lives and education of individuals with exceptionalities.
- Collaborate and build community to improve outcomes for individuals with exceptionalities.

Master of Science (M.S.)

Admission Requirements for the M.S. and M.Ed.

1. A bachelor’s degree.
2. For students seeking North Dakota teacher certification, T&L 315 Education of Exceptional Students, or its equivalent taken as either a prerequisite or corequisite with the master’s coursework.
3. For students seeking North Dakota teacher endorsement, an elementary reading methods course and an elementary math methods course taken as either prerequisites or corequisites with the master’s coursework.
4. A cumulative grade point average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on a = 4.00).
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Admissions Process

1. Complete the School of Graduate Studies online application.
2. Submit the application fee of $35.
3. Recommend three people who will complete the recommendation form:
   a. one from an employment supervisor or administrator;
   b. one from a professional colleague or university professor; and
   c. one from a person of your choosing.
4. Send official transcripts from each institution attended to the School of Graduate Studies.
5. Complete the personal statement and attach it in the “essay” section of the application. The personal statement should address three questions:
   a. describe several personal and professional goals you would like to achieve in the next five years including why these goals are important to you;
   b. describe the characteristics, attitudes, values, and/or skills that you think will make you a good candidate for your chosen professional role; and
   c. describe what you have done professionally or personally that you are proud of.

Descriptions of the Specialization Areas

Applied Behavior Analysis (ABA): The ABA specialization area includes coursework and an intensive practicum that focuses on concepts and principles, assessment and behavior change systems, methods and applications, ethics, and research methods. This specialization is approved by the Behavior Analyst Certification Board.

Autism Spectrum Disorders (ASD): The ASD specialization area focuses on children, adolescents, and adults with ASD and addresses several aspects of ASD including characteristics, assessment, methods/strategies, interagency collaboration/support, and application in a field setting.

Early Childhood Special Education (ECSE): The ECSE specialization area focuses on children from birth to age nine and addresses various disabilities, primarily developmental in nature, and addresses several aspects of ECSE including characteristics, assessment, methods/strategies, all forms of development, (e.g., language, physical), and application in a field setting.

Emotional Disturbance (ED): The ED specialization area focuses on children and adolescents with both emotional and behavior disorders and addresses several aspects of ED including characteristics, assessment, behavior and academic methods/strategies, and application in a field setting.

Gifted/Talented Education (GT): The GT specialization area focuses on children and youth with outstanding talent who perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. The specialization area addresses characteristics, assessment, methods/strategies, and application in a field setting.

Intellectual Disabilities (ID): The ID specialization area focuses on children and adolescents with DCD (the federal law refers to this population as those with mental retardation) and addresses several aspects of ID including characteristics, assessment, methods/strategies, and application in a field setting.

Learning Disabilities (LD): The LD specialization area focuses on children and adolescents with learning problems that are not due to developmental, emotional, or cognitive disabilities and addresses several aspects of LD.
including characteristics, assessment, methods/strategies, and application in a field setting.

**Special Education Strategist (SES):** The SES specialization area is a cross-categorical area that encompasses all of the courses in the specialization areas of ID, ED, and LD. Since it addresses three disability areas, it is the largest specialization area in number of credits required.

**Visual Impairment (VI):** The VI specialization area focuses on children and adolescents who are visually impaired or blind and addresses several aspects of VI including characteristics, assessment, braille code, methods/strategies, orientation/mobility, and application in a field setting.

### Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Special Education program. Note that the Master of Science degree provides both an on-campus and online format.

1. A minimum of 32 credits including credits required for the major/specialization.
2. At least one-half of the credits must be at or above the 500 level.
3. A maximum of one-fourth of the credit hours may be transferred from another institution.
4. Two credits of SPED 995 Scholarly Project or four credits of T&L 998 Thesis.
5. Five credits of scholarly tools/assessment courses. E.g.: 6. SPED 511 Identification and Assessment of Young Children with Special Needs 3
   - SPED 544 Research Methods in Behavior Analysis 3
   - SPED 545 Assessment and Behavior Change Systems 4
   - SPED 551 Advanced Assessment/Special Needs Students 3
   - SPED 557 Progress Monitoring/Special Needs Students 3
   - SPED 558 Response to Intervention 2
   - SPED 578 Behavior Management for Special Needs Students 3
   - SPED 587 ASD Assessment 2
   - SPED 590 Special Topics in Special Education 1-4
   - EFR 509 Introduction to Educational Research 3
   - EFR 515 Statistics I 3
   - T&L 569 Action Research 3

7. In addition to #4 and #5 above, choose one or more specialization areas and complete the required courses and elective courses for a minimum total of 32 credits for the M.S. degree*:

#### Applied Behavior Analysis (ABA)

**Required Courses**

- SPED 540 Concepts and Principles in Behavior Analysis 3
- SPED 541 Methods and Applications in Behavior Analysis 3
- SPED 542 Ethical and Professional Conduct for Behavior Analysts 3
- SPED 543 Applied Behavior Analysis Across Settings and Populations 2
- SPED 544 Research Methods in Behavior Analysis 3
- SPED 545 Assessment and Behavior Change Systems 4
- SPED 580 ABA Int 3
- SPED 580 ABA Intensive Practicum Level II 3
- T&L 529 Language Development & Cognition in Children 3
- T&L 553 Collaborative Relationships: Home, School and Community 3
- SPED 551 Advanced Assessment/Special Needs Students 3
- SPED 557 Progress Monitoring/Special Needs Students 3
- SPED 558 Response to Intervention 2
- SPED 583 Internship: Autism Spectrum Disorders 1-6

#### Emotional Disturbance (ED)

**Required Courses**

- SPED 506 Introduction to Emotional Disorders 2
- SPED 551 Advanced Assessment/Special Needs Students 3
- SPED 555 Advanced Methods: Emotionally Disturbed 3
- SPED 586 Internship: Emotional Disturbance 2-6

**Elective Courses**

Select six of the following: 15

- SPED 509 IEP Development
- SPED 521 Transition to Adult Life
- SPED 528 Advanced Assistive Technology
- SPED 552 Inclusive Methods
- T&L 553 Collaborative Relationships: Home, School and Community
- SPED 557 Progress Monitoring/Special Needs Students
- SPED 558 Response to Intervention
- SPED 578 Behavior Management for Special Needs Students
- EDL 529 Special Education Law

**Total Credits** 25-31

*If seeking special education endorsement in ECSE in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state’s requirements.

#### Elective Courses

- Select nine of the following: 18
  - SPED 540 Concepts and Principles in Behavior Analysis
  - SPED 562 Autistic Spectrum Disorder: Supports Across the Lifespan
  - SPED 563 Autistic Spectrum Disorder: Medical Issues and Trends
  - SPED 564 Structured Teaching
  - SPED 565 Methods for Students with Asperger Syndrome
  - SPED 566 Autistic Spectrum Disorder Intensive Early Intervention
  - SPED 578 Behavior Management for Special Needs Students
  - Additional credits from other specialization areas

**Total Credits** 25-30

### Early Childhood Special Education (ECSE)

**Required Courses**

- SPED 510 Early Intervention for Children with Special Needs 2
- SPED 511 Identification and Assessment of Young Children with Special Needs 3
- SPED 512 Methods and Materials for Preschool Children with Special Needs 3
- SPED 589 Internship: Early Childhood Special Education 2-8

**Elective Courses**

Select six of the following: 15

- SPED 509 IEP Development
- SPED 514 Intervention Strategies with Infants and Toddlers
- SPED 528 Advanced Assistive Technology
- T&L 529 Language Development & Cognition in Children
- T&L 553 Collaborative Relationships: Home, School and Community
- SPED 557 Progress Monitoring/Special Needs Students
- SPED 578 Behavior Management for Special Needs Students
- SPED 558 Response to Intervention
- SPED 590 Special Topics in Special Education (Infant/Toddler Mental Health)
- EDL 529 Special Education Law
- Additional credits from other specialization areas

**Total Credits** 25-31

This specialization is approved by the Behavior Analyst Certification Board.

### Autism Spectrum Disorders (ASD)

**Required Courses**

- SPED 560 Introduction to Autistic Spectrum Disorder 2
- SPED 561 Methods for Autistic Spectrum Disorder 2
- SPED 567 ASD Assessment 2

- SPED 580 ABA Int 3
- SPED 580 ABA Intensive Practicum Level II 3
- SPED 580 ABA Int 3

- SPED 580 ABA Intensive Practicum Level II 3
- T&L 529 Language Development & Cognition in Children 3
- T&L 553 Collaborative Relationships: Home, School and Community 3
- SPED 551 Advanced Assessment/Special Needs Students 3
- SPED 557 Progress Monitoring/Special Needs Students 3
- SPED 558 Response to Intervention 2
- SPED 578 Behavior Management for Special Needs Students 3
- EDL 529 Special Education Law
**General Special Education**

Note that there are no additional required courses. A minimum of 25 credits can be selected from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 500</td>
<td>Education of the Visually Impaired</td>
<td>3</td>
</tr>
<tr>
<td>SPED 501</td>
<td>Diseases and Function of the Eye</td>
<td>2</td>
</tr>
<tr>
<td>SPED 502</td>
<td>Braille Reading and Writing</td>
<td>2</td>
</tr>
<tr>
<td>SPED 503</td>
<td>Orientation and Mobility/Visually Impaired</td>
<td>2</td>
</tr>
<tr>
<td>SPED 504</td>
<td>Communication Media and Methods/Visually Impaired</td>
<td>3</td>
</tr>
<tr>
<td>SPED 505</td>
<td>Low Vision Assessment and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>SPED 506</td>
<td>Introduction to Emotional Disorders</td>
<td>2</td>
</tr>
<tr>
<td>SPED 507</td>
<td>Introduction to Intellectual Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 508</td>
<td>Introduction to Learning Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 509</td>
<td>IEP Development</td>
<td>2</td>
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<td>SPED 510</td>
<td>Early Intervention for Children with Special Needs</td>
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<tr>
<td>SPED 511</td>
<td>Identification and Assessment of Young Children with</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Special Needs</td>
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<tr>
<td>SPED 512</td>
<td>Methods and Materials for Preschool Children with</td>
<td>3</td>
</tr>
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<td></td>
<td>Special Needs</td>
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<tr>
<td>SPED 514</td>
<td>Intervention Strategies with Infants and Toddlers</td>
<td>2</td>
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<tr>
<td>SPED 521</td>
<td>Transition to Adult Life</td>
<td>3</td>
</tr>
<tr>
<td>SPED 528</td>
<td>Advanced Assistive Technology</td>
<td>1</td>
</tr>
<tr>
<td>SPED 540</td>
<td>Concepts and Principles in Behavior Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td>3</td>
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<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
<td>3</td>
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<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td></td>
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<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
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<td>SPED 555</td>
<td>Advanced Methods: Emotionally Disturbed</td>
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<td>SPED 556</td>
<td>Advanced Methods: Intellectual Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 557</td>
<td>Progress Monitoring/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
<td>2</td>
</tr>
<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
<td>2</td>
</tr>
<tr>
<td>SPED 561</td>
<td>Methods for Autistic Spectrum Disorder</td>
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<tr>
<td>SPED 562</td>
<td>Autistic Spectrum Disorder: Supports Across the</td>
<td>2</td>
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<tr>
<td></td>
<td>Lifespan</td>
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<td>SPED 563</td>
<td>Autistic Spectrum Disorder:Medical Issues and Trends</td>
<td>2</td>
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<tr>
<td>SPED 564</td>
<td>Structured Teaching</td>
<td>2</td>
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<td>SPED 565</td>
<td>Methods for Students with Asperger Syndrome</td>
<td>2</td>
</tr>
<tr>
<td>SPED 566</td>
<td>Autistic Spectrum Disorder Intensive Early Intervention</td>
<td>2</td>
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<tr>
<td>SPED 567</td>
<td>ASD Assessment</td>
<td>2</td>
</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
<td>3</td>
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<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
<td>3</td>
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<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education ( Infant and</td>
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<tr>
<td></td>
<td>Toddler Mental Health)</td>
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**Gifted/Talented (GT)**

**Required Courses**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>SPED 522</td>
<td>Introduction to Gifted/Talented Education</td>
<td>3</td>
</tr>
<tr>
<td>SPED 523</td>
<td>Assessment in Gifted/Talented Education</td>
<td>3</td>
</tr>
<tr>
<td>SPED 524</td>
<td>Teaching Methods in Gifted/Talented Education</td>
<td>3</td>
</tr>
<tr>
<td>SPED 584</td>
<td>Internship: Gifted/Talented</td>
<td>2-6</td>
</tr>
</tbody>
</table>

**Elective Courses**

Select five of the following: 15

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
<td></td>
</tr>
</tbody>
</table>

**Intellectual Disabilities (ID)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 507</td>
<td>Introduction to Intellectual Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>SPED 556</td>
<td>Advanced Methods: Intellectual Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 587</td>
<td>Internship: Intellectual Disabilities</td>
<td>1-6</td>
</tr>
</tbody>
</table>

**Elective Courses**

Select six of the following: 15

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
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<tbody>
<tr>
<td>SPED 509</td>
<td>IEP Development</td>
<td></td>
</tr>
<tr>
<td>SPED 521</td>
<td>Transition to Adult Life</td>
<td></td>
</tr>
<tr>
<td>SPED 528</td>
<td>Advanced Assistive Technology</td>
<td></td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>SPED 557</td>
<td>Progress Monitoring/Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
<td></td>
</tr>
<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
<td></td>
</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
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</table>

**Learning Disabilities (LD)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 508</td>
<td>Introduction to Learning Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 588</td>
<td>Internship: Learning Disabilities</td>
<td>2-6</td>
</tr>
</tbody>
</table>

**Elective Courses**

Select five of the following: 15

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<td>EDL 529</td>
<td>Special Education Law</td>
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</tbody>
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If seeking special education endorsement in LD in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state's requirements.

**Strategist (SES)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 506</td>
<td>Introduction to Emotional Disorders</td>
<td>2</td>
</tr>
<tr>
<td>SPED 507</td>
<td>Introduction to Intellectual Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 508</td>
<td>Introduction to Learning Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 555</td>
<td>Advanced Methods: Emotionally Disturbed</td>
<td>3</td>
</tr>
<tr>
<td>SPED 556</td>
<td>Advanced Methods: Intellectual Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 586</td>
<td>Internship: Emotional Disturbance</td>
<td>2-6</td>
</tr>
<tr>
<td>SPED 587</td>
<td>Internship: Intellectual Disabilities</td>
<td>2-6</td>
</tr>
<tr>
<td>SPED 588</td>
<td>Internship: Learning Disabilities</td>
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</table>

**Elective Courses**

Select one of the following: 1

<table>
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</thead>
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<td>IEP Development</td>
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<td>Advanced Assistive Technology</td>
<td></td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</td>
<td></td>
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<tr>
<td>SPED 557</td>
<td>Progress Monitoring/Special Needs Students</td>
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<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
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</tr>
<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
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</tr>
<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional credits from the other specialization areas</td>
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</tr>
</tbody>
</table>

Total Credits 25-37

If seeking special education endorsement in SES in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state's requirements.

**Visual Impairment (VI)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 500</td>
<td>Education of the Visually Impaired</td>
<td>3</td>
</tr>
<tr>
<td>SPED 502</td>
<td>Braille Reading and Writing</td>
<td>2</td>
</tr>
<tr>
<td>SPED 505</td>
<td>Low Vision Assessment and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>SPED 585</td>
<td>Internship: Visual Impairment</td>
<td>2-6</td>
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</tbody>
</table>

**Elective Courses**

Select six of the following: 15

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SPED 501</td>
<td>Diseases and Function of the Eye</td>
<td></td>
</tr>
<tr>
<td>SPED 503</td>
<td>Orientation and Mobility/Visually Impaired</td>
<td></td>
</tr>
<tr>
<td>SPED 504</td>
<td>Communication Media and Methods/Visually Impaired</td>
<td></td>
</tr>
<tr>
<td>SPED 509</td>
<td>IEP Development</td>
<td></td>
</tr>
<tr>
<td>SPED 521</td>
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<td>Advanced Assistive Technology</td>
<td></td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</td>
<td></td>
</tr>
<tr>
<td>SPED 557</td>
<td>Progress Monitoring/Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
<td></td>
</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education (Braille Code)</td>
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<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional credits from the other specialization areas</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 24-28

If seeking special education endorsement in VI in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state's requirements.

**Master of Education (M.Ed.)**

**Degree Requirements**

Students seeking the Master of Education degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Special Education program. Note that the Master of Education degree provides an on-campus format only.

1. A minimum of 32 credits including credits required for the major/specialization.
2. At least one-half of the credits must be at or above the 500 level.
3. A maximum of one-fourth of the credit hours may be transferred from another institution.
4. Two credits of SPED 995 Scholarly Project or four credits of T&L 998 Thesis.
5. Six credits of foundations of education courses, e.g.:
6. EFR 500 Introduction to the Foundations of Education 3
7. In addition to #4 and #5 above, choose one or more specialization areas and complete the required courses and elective courses for a minimum total of 32 credits for the M.Ed. degree:

**Autism Spectrum Disorders (ASD)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
<td>2</td>
</tr>
<tr>
<td>SPED 561</td>
<td>Methods for Autistic Spectrum Disorder</td>
<td>2</td>
</tr>
<tr>
<td>SPED 567</td>
<td>ASD Assessment</td>
<td>2</td>
</tr>
<tr>
<td>SPED 583</td>
<td>Internship: Autism Spectrum Disorders</td>
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**Elective Courses**

Select nine of the following: 18

<table>
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<tbody>
<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
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<tr>
<td>SPED 562</td>
<td>Autism Spectrum Disorder: Supports Across the Lifespan</td>
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<td>SPED 563</td>
<td>Autistic Spectrum Disorder: Medical Issues and Trends</td>
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<tr>
<td>SPED 564</td>
<td>Structured Teaching</td>
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<tr>
<td>SPED 565</td>
<td>Methods for Students with Asperger Syndrome</td>
<td></td>
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<tr>
<td>SPED 566</td>
<td>Autism Spectrum Disorder Intensive Early Intervention</td>
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</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
<td></td>
</tr>
<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education (Introduction to ABA)</td>
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<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education (Experimental Analysis of Behavior)</td>
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<td></td>
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Total Credits 25-30

**Early Childhood Special Education (ECSE)**

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SPED 510</td>
<td>Early Intervention for Children with Special Needs</td>
<td>2</td>
</tr>
</tbody>
</table>
Required Courses
SPED 506 Introduction to Emotional Disorders 2
SPED 551 Advanced Assessment/Special Needs Students 3
SPED 555 Advanced Methods: Emotionally Disturbed 3
SPED 586 Internship: Emotional Disturbance 2-6

Elective Courses
Select five of the following: 15
- SPED 509 IEP Development
- SPED 521 Transition to Adult Life
- SPED 528 Advanced Assistive Technology
- SPED 552 Inclusive Methods
- T&L 553 Collaborative Relationships: Home, School and Community

Total Credits: 25-29

* If seeking special education endorsement in ED in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state’s requirements.

**Intellectual Disabilities (ID)**

Required Courses
SPED 507 Introduction to Intellectual Disabilities 2
SPED 551 Advanced Assessment/Special Needs Students 3
SPED 556 Advanced Methods: Intellectual Disabilities 3
SPED 587 Internship: Intellectual Disabilities 1-6

Elective Courses
Select six of the following: 15
- SPED 509 IEP Development
- SPED 521 Transition to Adult Life
- SPED 528 Advanced Assistive Technology
- SPED 552 Inclusive Methods
- T&L 553 Collaborative Relationships: Home, School and Community
- SPED 557 Progress Monitoring/Special Needs Students
- SPED 558 Response to Intervention
- SPED 560 Introduction to Autism Spectrum Disorder
- SPED 578 Behavior Management for Special Needs Students
- EDL 529 Special Education Law

Total Credits: 24-29

* If seeking special education endorsement in DCD in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state’s requirements.

**Learning Disabilities (LD)**

Required Courses
SPED 508 Introduction to Learning Disabilities 2
SPED 551 Advanced Assessment/Special Needs Students 3
SPED 554 Advanced Methods: Learning Disabilities 3
SPED 588 Internship: Learning Disabilities 2-6

Elective Courses
Select six of the following: 15
- SPED 509 IEP Development
- SPED 521 Transition to Adult Life
- SPED 528 Advanced Assistive Technology
- SPED 552 Inclusive Methods
- T&L 553 Collaborative Relationships: Home, School and Community
- SPED 557 Progress Monitoring/Special Needs Students
- SPED 558 Response to Intervention
- SPED 578 Behavior Management for Special Needs Students
- EDL 529 Special Education Law

Total Credits: 25-29

* If seeking special education endorsement in GT in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state’s requirements.
If seeking special education endorsement in LD in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state's requirements.

### Strategist (SES)

#### Required Courses

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<tr>
<td>SPED 507</td>
<td>Introduction to Intellectual Disabilities</td>
<td>2</td>
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<tr>
<td>SPED 508</td>
<td>Introduction to Learning Disabilities</td>
<td>2</td>
</tr>
<tr>
<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
<td>3</td>
</tr>
<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
<td>3</td>
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<tr>
<td>SPED 555</td>
<td>Advanced Methods: Emotionally Disturbed</td>
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<td>SPED 556</td>
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</tr>
<tr>
<td>SPED 586</td>
<td>Internship: Emotional Disturbance</td>
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<tr>
<td>SPED 587</td>
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<td>2-6</td>
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<td>Internship: Learning Disabilities</td>
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#### Elective Courses

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<td>EDL 529</td>
<td>Special Education Law</td>
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</table>

Additional credits from the other specialization areas

Total Credits 25-37

If seeking special education endorsement in SES in North Dakota, confer with your advisor regarding these requirements. If seeking teacher certification in a state other than North Dakota, refer to that state's requirements.

### Visual Impairment (VI)

#### Required Courses

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SPED 500</td>
<td>Education of the Visually Impaired</td>
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</tr>
<tr>
<td>SPED 502</td>
<td>Braille Reading and Writing</td>
<td>2</td>
</tr>
<tr>
<td>SPED 505</td>
<td>Low Vision Assessment and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>SPED 585</td>
<td>Internship: Visual Impairment</td>
<td>2-6</td>
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</tbody>
</table>

#### Elective Courses

Select six of the following:

<table>
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<tr>
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<td>SPED 501</td>
<td>Diseases and Function of the Eye</td>
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<td>SPED 503</td>
<td>Orientation and Mobility/Visually Impaired</td>
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<td>SPED 504</td>
<td>Communication Media and Methods/Visually Impaired</td>
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<tr>
<td>SPED 509</td>
<td>IEP Development</td>
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<tr>
<td>SPED 521</td>
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<td>Advanced Assistive Technology</td>
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<td>T&amp;L 553</td>
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<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education (Braille Code)</td>
</tr>
<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
</tr>
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</table>

Additional credits from the other specialization areas

Total Credits 24-28

### Courses

#### SPED 500. Education of the Visually Impaired. 3 Credits.

A course which provides an overview of the field of visual impairment to include the following areas of emphases: History/Philosophy; Service-delivery models; medical, psychological and educational implications of partial vision or total blindness; curricula methods and materials; current issues/trends.

#### SPED 501. Diseases and Function of the Eye. 2 Credits.

A course which introduces students to: a) the structural parts of the eye and its functions; b) common ocular conditions and diseases and their implications for education; c) interpretation of medical eye examination reports; and d) special considerations for infants, school-age academic, multiply disabled and adult populations.

#### SPED 502. Braille Reading and Writing. 2 Credits.

In this course students learn: 1) to read and write the literary code of grade 2 braille and 2) to teach the literary code of grade 2 braille to students of all ages.

#### SPED 503. Orientation and Mobility/Visually Impaired. 2 Credits.

This course introduces students to basic orientation and mobility techniques used by specialists when working with individuals with low vision and blindness. Concept development, kinesiology, tactile map construction, dog guides, electronic mobility devices and parental involvement are topics covered with respect to various populations (i.e. infants, schoolage academic children, multiply disabled children and adults).

#### SPED 504. Communication Media and Methods/Visually Impaired. 3 Credits.

This course provides an overview of the communication devices and adaptive technology used by the visually disabled. Students learn to read and write the braille codes for mathematics and music, do basic calculations on the abacus, brailer and talking calculator and gain familiarity with computers and software currently used in the field. Prerequisite: Consent of instructor.

#### SPED 505. Low Vision Assessment and Remediation. 2 Credits.

A course which focuses on children who have severe visual deficits but with proper training are able to utilize their vision for learning. Effects of low vision are studied with respect to psychological/sociological development, academic learning, skills of independent living, and vocational choice. Methods of assessing visual function are examined with emphasis on adaptations needed in the educational settings. Optical and non-optical aids are compared and evaluated. Prerequisite: T&L 315 or consent of instructor.

#### SPED 506. Introduction to Emotional Disorders. 3 Credits.

The historical perspective and the complexities of identification and characteristics of emotional disorders will be covered. Students will gain an understanding of service delivery models within a multisystems approach. F,S,SS.

#### SPED 507. Introduction to Intellectual Disabilities. 3 Credits.

The historical perspectives and the complexities of identification and characteristics of developmental/cognitive disabilities will be covered. Students will gain an understanding of service delivery models within a multi-systems approach. F,S,SS.

#### SPED 508. Introduction to Learning Disabilities. 3 Credits.

The historical perspective and the complexities of identification and characteristics of learning disabilities will be covered. Students will gain an understanding of service delivery models within a multi-systems approach. F,S,SS.

#### SPED 509. IEP Development. 2 Credits.

This course is an introduction to the individualized education plan (IEP) process, including an understanding of how to develop and write effective IEPs for students with disabilities. In addition, the IEP template and process used by the state of North Dakota (i.e., TIENET) will be addressed.

#### SPED 510. Early Intervention for Children with Special Needs. 3 Credits.

An introduction to the field of Early Childhood Special Education, primarily for students interested in entering the field. Issues such as program design, parent involvement, identification, infant education, and effects of disabilities will be covered. F,S,SS.

Total Credits 24-28
SPED 511. Identification and Assessment of Young Children with Special Needs. 3 Credits.
A study of the principles and procedures for screening, identifying and evaluating young children with special needs. Emphasis will be placed on exposing students to available assessment instruments and providing opportunities for actual testing of preschoolers. Prerequisite: Admission to one of the master's programs in special education.

SPED 512. Methods and Materials for Preschool Children with Special Needs. 3 Credits.
A comprehensive study of curricula, program development and intervention strategies for disabled children ages birth to 6. Prerequisite: Admission to one of the master's programs in special education.

SPED 514. Intervention Strategies with Infants and Toddlers. 3 Credits.
This course provides for study into the unique needs of infants and toddlers with disabilities as well as the delivery of intervention services to the very young child with disabilities and his/her family. SS.

SPED 515. Professional Development. 1 Credit.
This course will provide an orientation to the roles and responsibilities of being a resident teacher in special education. Restricted to resident teachers in special education.

SPED 521. Transition to Adult Life. 3 Credits.
This course focuses on education, personal and vocational transition issues for students with disabilities across all grade levels into adult life. Assessment and transition program planning will be covered along with interagency collaboration skills and career awareness.

SPED 522. Introduction to Gifted/Talented Education. 3 Credits.
Historical and evolutionary research, theories, and philosophies for understanding the developmental and social-emotional needs of the more able child from early childhood through adolescence in educational experiences. Characteristics of G/T learners in the intellectual, leadership, academic, and creative realms; asynchronous; stereotypes; comorbidities; issues surrounding the identification of G/T learners. Cultural and societal influences on the field; educational trends. Prerequisite: T&L 315 or permission of the instructor.

SPED 523. Assessment in Gifted/Talented Education. 3 Credits.
Formal and informal assessments of characteristics of G/T learners in the intellectual, leadership, academic, and creative realms for identification and qualification for educational programming; assessment of readiness and content mastery. Ongoing assessment, progress monitoring, and data interpretation skills will be practiced. Issues surrounding the identification of G/T learners, including misdiagnosis, stereotyping, and bias will be critically evaluated. Legal issues surrounding this area, and cultural influences on data sources will be explored. Prerequisite: T&L 315, and T&L 423 or SPED 551, or permission of the instructor.

SPED 524. Teaching Methods in Gifted/Talented Education. 3 Credits.
Methodological and pedagogical approaches for fulfilling the unique academic, intellectual, creative, social, and emotional needs of the more able child in the educational environment. Exploration and analysis of contributing research, theories, and philosophies for designing differentiated learning opportunities from early childhood through adolescence via multiple modes (i.e. Bloom's Taxonomy, Multiple Intelligence's, technologies, multicultural and creative materials, etc.); educational trends through curriculum design and the integration of formal and informal assessment data and national/state standards to create individualized learning goals through curriculum compacting, tiering, acceleration, academic planning, modifications, and mentorships. Exploration and analysis of curriculum models to suit various learning needs of the asynchronous child with multiple forms of exceptionality (LD, ED, ASD, ELL); legal, cultural, and stereotype issues affecting the implementation of enriched curriculum for the G/T child with comorbidities. Prerequisite: SPED 522.

SPED 528. Advanced Assistive Technology. 1 Credit.
This course covers the types and functions of assistive technology for students with disabilities across a variety of settings, e.g., home, schools and community. Assistive technology assessment and a working knowledge of best practices of assistive technology in the lives of students will be addressed. Identification of funding sources and assistive technology resources will also be covered.

SPED 540. Concepts and Principles in Behavior Analysis. 3 Credits.
This course introduces definitions, characteristics, principles, processes and concepts of Applied Behavior Analysis. In addition, the philosophical assumptions and dimensions of the science of applied behavior analysis, including determinism, empiricism, parsimony, selectionism, pragmatism, and lawfulness of behavior will be addressed. Students will learn to differentiate between environmental and mentalistic explanations of behavior, and between conceptual, experimental, and applied analyses of behavior. F,S,SS.

SPED 541. Methods and Applications in Behavior Analysis. 3 Credits.
This course addresses behaviorally-based strategies to establish, strengthen, and weaken target behaviors. Fundamental elements of behavior change are reviewed, with a focus on selecting evidence-based tactics that utilize basic principles of behavior (reinforcement, punishment, extinction, and stimulus control), as well as utilizing appropriate parameters and schedules of reinforcement and punishment. Various procedures combining fundamental behavior principles are reviewed, modeled, practiced, and demonstrated to mastery and fluency. F,S,SS.

SPED 542. Ethical and Professional Conduct for Behavior Analysts. 3 Credits.
This course introduces ethical and professional considerations relevant in the professional practice of applied behavior analysis as well as the ethical and disciplinary standards of the profession. Students will become familiar with the ethical and professional conduct and legal issues relevant to Board Certified Behavior Analyst-level practitioners found in the Behavior Analyst Certification Board’s Guidelines for Responsible Conduct for Behavior Analysts and Disciplinary and Ethical Standards and Disciplinary Procedures (2012), as well as the professional conduct consistent with the practice of applied behavior analysis. F,S,SS.

SPED 543. Applied Behavior Analysis Across Settings and Populations. 2 Credits.
This course will focus on client-centered responsibilities across settings, including identification of the problem and selection and implementation of interventions based on biological, medical, and environmental variables. The course will also address management of behavioral services and supervision of those responsible for carrying out behavior change procedures. F,S,SS.

SPED 544. Research Methods in Behavior Analysis. 3 Credits.
This course focuses on the measurement of behavior and the analysis of intervention effect using single-subject experimental design. Procedures for collection and display of behavioral data are demonstrated, practiced, and examined for reliability, validity, efficiency, and relevance to a variety of settings, with a focus on educational environments. Individualized measurement procedures are developed and implemented using a variety of single-subject design formats, and the contribution of single-subject research design to education, clinical practice, and scientific inquiry is examined. Ethical considerations of experimental analysis are examined. F,S,SS.

SPED 545. Assessment and Behavior Change Systems. 4 Credits.
This course will address the process of identifying behaviors targeted for change and the use of behavioral assessment techniques to identify and analyze behavior-environment relations for the purpose of developing successful, functionally-based intervention strategies. Students will learn a variety of methods for behavior assessment, interventions, analysis of interventions, experimental analysis, and interpreting outcomes including the use of practical behaviorally-based assessment tools such as checklists, rating scales, structured observation tools, and curricular assessments. F,S,SS.

SPED 551. Advanced Assessment/Special Needs Students. 3 Credits.
Theory and practice of assessment, including formal and informal procedures for screening, identification and assessment of students with disabilities. Practical assignment included. Prerequisite: Admission to one of the master's programs in special education. F,S,SS.

SPED 552. Inclusive Methods. 3 Credits.
The study of a variety of methods and materials for teaching and assessing children and youth with learning and behavior problems in the general education classroom.

SPED 554. Advanced Methods: Learning Disabilities. 3 Credits.
The study of specific strategies, methods, and materials for working with students with learning disabilities. Prerequisite: Admission to one of the master's programs in special education.

SPED 555. Advanced Methods: Emotionally Disturbed. 3 Credits.
The study of specific strategies, methods, and materials for working with students with emotional/behavioral disorders. Prerequisite: Admission to one of the master's programs in special education.
SPED 556. Advanced Methods: Intellectual Disabilities. 3 Credits.
This course is a masters level methods course designed for professionals seeking to extend their skills in the areas of instruction, functional (life skills) curriculum, program and curriculum development, and functional behavioral analysis for working with students with moderate to severe intellectual disabilities. Prerequisites: Graduate status and admission to one of the master's programs in special education. F.S.S.

SPED 557. Progress Monitoring/Special Needs Students. 3 Credits.
This course covers all aspects of progress monitoring including what it is, how it works, the benefits of progress monitoring, various ways and strategies for conducting progress monitoring and how it functions in a Response to Intervention (RTI) model. Students will learn how to track students in reading, math, and written language by collecting data and then using that data to measure student progress and in instructional decision-making. The strongest research-based strategy for progress monitoring, curriculum-based measurement, will be covered in depth. Prerequisite: Admission to one of the master's programs in special education. F.S.S.

SPED 558. Response to Intervention. 2 Credits.
This course will address common elements of Response to Intervention (RTI) including definition, components of successful RTI models, establishing RTI teams and building capacity for school-wide RTI implementation, the use of standard protocol in RTI implementation, monitoring progress in academics and behavior within RTI models, understanding guidelines for problem-solving/decision making in RTI, as well as the future direction of RTI. F.S.S.

SPED 560. Introduction to Autistic Spectrum Disorder. 3 Credits.
This is the introductory course in a sequence of interdisciplinary courses focusing on autism spectrum disorder. Its central purpose is to encourage parents and caregivers of individuals with autism spectrum disorder to engage in reflective thinking about and critical analysis of the many and varied issues, e.g., identification, educational placement, effective treatments, vocational training, related to the provision of quality lifelong supports for these individuals. Prerequisites: Completed degree from a related field of study, or seniors who have completed T&L 315, and are completing an undergrad degree from a related field of study (see dept for approval). F.S.S.

SPED 561. Methods for Autistic Spectrum Disorder. 3 Credits.
This is a required course in a sequence of interdisciplinary courses focusing on autism spectrum disorder (ASD). Its central purpose is to address commonly implemented intervention strategies, particularly those considered to be evidence based or research supported in the field of ASD. This course examines the current literature base supporting various interventions and strategies with a focus on matching the needs and strengths of individuals with ASD to the most appropriate intervention method based on data driven practice and research support for a particular intervention. Prerequisite or corequisite: SPED 560. F.S.S.

SPED 562. Autistic Spectrum Disorder: Supports Across the Lifespan. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Issues related to parental reactions to diagnosis, stressors at home and school, strategies for empowering families, transitional situations for individuals with ASD, transitions to jobs and college, and legal issues will be explored. The central purpose of the course is threefold: a) to provide current information related to the chronic stressors experienced by caregivers for and family members of persons with ASD, b) to provide current information regarding career/vocational options related to transition from high school through adult life, e.g., young adults, middle-aged adults, older adults, and c) to provide current information regarding legal issues related to the provision of lifelong supports for persons with ASD. Prerequisite: Completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. F.S.

SPED 563. Autistic Spectrum Disorder:Medical Issues and Trends. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autism spectrum disorders (ASD). The purpose of this course is to examine the historical perspective and complexities of the role of medicine and medically oriented interventions for individuals with ASD. Issues will be explored related to conducting wellness examinations, current and future medical treatments, genetics, collaboration, and resources. Prerequisite: A completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. F.S.

SPED 564. Structured Teaching. 3 Credits.
This is an elective course in the sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to encourage parents and caregivers of individuals with ASD to engage in reflective thinking about and critical analysis of this educational approach for these persons. Prerequisites or corequisites: SPED 560 and SPED 561. F.

SPED 565. Methods for Students with Asperger Syndrome. 3 Credits.
This course is in a sequence of interdisciplinary courses focusing on autistic spectrum disorders (ASD), specifically focusing on those individuals with diagnoses or high functioning autism, Aspergers, and ASD with lower levels of support needed. The purpose of this course is to equip individuals interacting and working with people with high functioning ASD the pertinent background knowledge and experience with the diagnosis and characteristics to effectively implement assessments, functional analysis, various methods and practices, and transition planning to support individuals with ASD and their families. Prerequisite: A completed degree from a related field of study. Prerequisites or corequisites: SPED 560 and SPED 561. SS.

SPED 566. Autistic Spectrum Disorder Intensive Early Intervention. 3 Credits.
This is an elective course in the sequence of interdisciplinary courses focusing on children with autistic spectrum disorder (ASD) birth to age six. Topics addressed will include basic characteristics of children with ASD birth to age six, the developmental implications for these children and their families, and research-supported early interventions utilizing a family-centered approach with an emphasis on natural learning opportunities. Prerequisite: A completed degree from a related field of study. F.S.S.

SPED 567. ASD Assessment. 3 Credits.
This course is a required course in a sequence of interdisciplinary courses focusing on autistic spectrum disorders (ASD). This course will address the entire process of program planning for students with ASD including screening, evaluative assessment, ongoing assessment, using assessment to guide intervention planning, and monitoring progress. Students will explore a variety of methods and tools commonly used with individuals with ASD; specifically standardized assessments, checklists, rating scales, structured observation tools, and curricular based assessments. Its central focus is on assessing the ongoing needs and strengths of individuals with ASD in order to plan successful interventions in further differentiating instruction. Prerequisite: SPED 560. Corequisite: SPED 561. F.S.S.

SPED 578. Behavior Management for Special Needs Students. 3 Credits.
The study of a variety of effective behavior management and assessment techniques appropriate to the needs of children and youth with special needs. Topics include procedures to increase self-awareness, self-management, self control, self and assessment procedures and techniques for determining behavioral needs. Prerequisite: Admission to one of the master's programs in special education.

SPED 580. Practicum: Special Education. 1-6 Credits.
Practicum in the study of children and adolescents with disabilities in school and related settings. May be repeated to 8 credits. Repeatable to 8 credits. F.S.S.

SPED 583. Internship: Autism Spectrum Disorders. 1-6 Credits.
This is a culminating experience for students in the area of autism spectrum disorders. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 560, SPED 561, and consent of the instructor. Repeatable to 6 credits.

SPED 584. Internship: Gifted/Talented. 1-6 Credits.
This is a culminating experience for students in the area of gifted/talented. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 522, SPED 523, and SPED 524, or consent of the instructor. Repeatable to 6 credits.

SPED 585. Internship: Visual Impairment. 1-6 Credits.
This is a culminating experience for students who are seeking licensure or an endorsement in the area of visual impairment. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Repeatable up to 6 credits maximum. Prerequisites: SPED 500, SPED 501, SPED 502, and consent of the instructor. Repeatable to 6 credits. F.S.S.
SPED 586. Internship: Emotional Disturbance. 1-6 Credits. This is a culminating experience for students in the area of emotional disturbance. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 587. Internship: Intellectual Disabilities. 1-6 Credits. This is a culminating experience for students in the area of Intellectual disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits. F,S,SS.

SPED 588. Internship: Learning Disabilities. 1-6 Credits. This is a culminating experience for students in the area of learning disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 589. Internship: Early Childhood Special Education. 1-4 Credits. This is a culminating experience for students who are seeking licensure or an endorsement in the area of early childhood special education. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 510, SPED 511 and SPED 512, and consent of the instructor. Repeatable to 4 credits.

SPED 590. Special Topics in Special Education. 1-4 Credits. Exploration of special topics in the study of special education. May be repeated for different topics. Repeatable to 30 credits.

SPED 591. Readings: Special Education. 1-4 Credits. Designed primarily for advanced graduate students. May be repeated for different topics. Repeatable. F,S,SS.

SPED 593. Independent Project: Special Education. 1-4 Credits. Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisites: Consent of advisor and Instructor. Repeatable.

SPED 995. Scholarly Project. 2 Credits. The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner that is directly related to their roles as teachers, program evaluators, and action researchers. The scholarly project must be approved by the student's advisor. F,S,SS.

SPED 997. Independent Study Report. 2 Credits. Independent study and preparation of a written report for students taking the non-thesis option in the Master's program. F,S,SS.

Engineering
http://www.und.edu/dept/sem/

Faculty: Alshami, Ames, Bandypopadyhay, Bibel, Bowman, Cavalli, Faruque, Fazel-Rezai, Gedafa, Grewal, Gullicks, Gupta, Ho, Jabbari, Jerath, Ji, Kaabouch, Kodokda, Krishnamoorthy, Lim, Ling, Lindseth, Mamaghani, Mann, Moretti, Nejadpak, Neubert, Noghanian, Ostadassian, Rabiei, Ranganathan, Rasouli, Salehtar (Program Director), Seams, Semke, Suleiman, Tande, Tang, Tavakolian, Wang, Willis, Yang, and Zahi.

The College of Engineering and Mines offers the Master of Engineering and the Master of Science degree with majors in chemical engineering, civil engineering, electrical engineering, environmental engineering, and mechanical engineering. The Master of Science degree is offered with majors in chemical engineering, civil engineering, environmental engineering, and mechanical engineering. The Doctor of Philosophy degree is offered with majors in engineering and geology, and the Doctor of Philosophy in chemical, civil, electrical, geological, and mechanical engineering, and the multi-disciplinary focal areas of energy and environmental engineering is also offered.

SPED 585. Internship: Emotional Disturbance. 1-6 Credits. This is a culminating experience for students in the area of emotional disturbance. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 587. Internship: Intellectual Disabilities. 1-6 Credits. This is a culminating experience for students in the area of Intellectual disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits. F,S,SS.

SPED 588. Internship: Learning Disabilities. 1-6 Credits. This is a culminating experience for students in the area of learning disabilities. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPED 589. Internship: Early Childhood Special Education. 1-4 Credits. This is a culminating experience for students who are seeking licensure or an endorsement in the area of early childhood special education. This course is designed for students to synthesize previously learned information from coursework as they apply and implement their knowledge and skills through written products and classroom performance. Prerequisites: SPED 510, SPED 511 and SPED 512, and consent of the instructor. Repeatable to 4 credits.

SPED 590. Special Topics in Special Education. 1-4 Credits. Exploration of special topics in the study of special education. May be repeated for different topics. Repeatable to 30 credits.

SPED 591. Readings: Special Education. 1-4 Credits. Designed primarily for advanced graduate students. May be repeated for different topics. Repeatable. F,S,SS.

SPED 593. Independent Project: Special Education. 1-4 Credits. Designed primarily for advanced graduate students. May be repeated for different topics. Prerequisites: Consent of advisor and Instructor. Repeatable.

SPED 995. Scholarly Project. 2 Credits. The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study. The project allows students to demonstrate scholarly skills in an integrated manner that is directly related to their roles as teachers, program evaluators, and action researchers. The scholarly project must be approved by the student's advisor. F,S,SS.

SPED 997. Independent Study Report. 2 Credits. Independent study and preparation of a written report for students taking the non-thesis option in the Master's program. F,S,SS.

Degree Granted: Doctor of Philosophy (Ph.D.)

The Doctor of Philosophy in Engineering program provides a student with specialized training customized to meet his or her specific interests and goals. Faculty advisors work with each student to structure a graduate program consisting of traditional engineering study, complementary multidisciplinary studies, strong interaction between fellow engineering students, and high quality research. The program is based upon the research strengths of faculty, and includes studies in the major engineering disciplines. Students receive a Ph.D. of Engineering with a specified track of: Civil Engineering, Electrical Engineering, Energy Engineering, Environmental Engineering, Geological Engineering, or Mechanical Engineering. Department of Chemical Engineering offers a discipline specific PhD program in Chemical Engineering.

The program includes a significant research component characterized by substantial interaction between the student and their adviser. Research topics are determined based upon the mutual interest of the student and research adviser. Students develop a strong research methodology and apply this research method to a specific engineering problem as directed by their adviser. Student's attendance is required at a weekly seminar. This seminar is used to enhance the research methodology, by allowing students to present their research during various stages of development. The seminar also serves the important role of providing exposure of all students to a diverse range of multidisciplinary work.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section.

Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings.

Goal 1: Graduates will have a depth of knowledge in their chosen engineering emphasis area accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

Goal 3: Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in engineering or a related field.

Doctor of Philosophy (Ph.D.)

Admission Requirements

1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or higher or a Master of Science degree in an engineering discipline with a GPA of 3.0.
2. Satisfy the Graduate School’s English Language Proficiency requirements as published in the Graduate Catalog.
3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers GRE test scores (students with a B.S. engineering degree from an ABET accredited program are
The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better, which must include at least one course in numerical analysis. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.

5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the track-specific seminar class or ENGR 562- Seminar in Engineering must be taken.
7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this graduate catalog). The coursework will include the following:
   a. A minimum of 27 credit hours of track specific coursework selected from the approved list of courses. Equivalent graduate level coursework may be transferred from a master’s program.
   b. Multidisciplinary emphasis: A minimum of 12 credit hours of 300, 400, or 500 level coursework taken for graduate credit from any department within the University, subject to the approval of the student’s adviser.

The student is encouraged to structure these courses as a minor.

Equivalent course work may be transferred from a master’s program.

8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. This examination will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

9. An oral comprehensive examination is completed when at least 30 credits of post baccalaureate coursework has been completed. This examination will be based significantly on the core of the individual’s program of study including work in the minor field of study, but may also include questions related to other track-specific Engineering fundamentals. The examination will be administered by three faculty members from the program of the student’s track.

Three results of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates, who fail the exam, will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial examination attempt.

10. Students must present to their advisory committee an annual oral progress report describing research progress. One of these presentations will include a detailed presentation of the dissertation research plan. This presentation must be completed at least one year prior to the expected completion of the Ph.D. requirements. These presentations may be made as a partial fulfillment of the students track-specific Seminar or Seminar in Engineering (ENGR 562) requirements with approval of the student’s advisory committee.

11. A candidate for the degree must complete an original basic research investigation. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a dissertation covering the research. The project must represent an original and independent investigation by the student. It is normally expected that the results of the research will be submitted for publication in refereed research journals. The candidate will present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (p. 623)).

For Ph.D. students in the Electrical Engineering track, instead of the above requirements in 8-11, the following requirements in 12-16 must be met.

12. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of
their second year of residence. The qualifying examination includes the following three sections.

Section I

It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II

A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:

A) a literature review of the relevant field of research related to the project
B) proposed methods
C) preliminary results (simulation or experiment)
D) the objectives of the proposed project, and
E) tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written exam, student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade a date can be scheduled for an oral presentation (i.e., Section III). If failed, student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III

An oral comprehensive examination should be presented to the committee on the research topics described in the above section (II-A to II-E). Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than 6 months as specified by the student committee. Student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

13. After successful completion of the written research proposal and oral presentation, an annual oral progress report should be presented to the committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.

14. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a written dissertation covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed research journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists the PhD committee and an external examiner from outside the University. The external examiner is selected by the department’s graduate committee from a list of three candidates proposed by the advisor. The external examiner should not have any common publication with the student’s advisor or student and can be from academia or industry with expertise relevant to the student’s research. The student and advisor should not contact the external examiner directly before or after.

15. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.courseleaf.com/graduatestudies)). Four results of the examination can be obtained: 1) pass; 2) minor revision 3) major revision and 4) fail. For minor revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a PhD degree and may request to be reclassified as a master’s student and complete a Master of Science degree.

16. At least two peer reviewed ISI (Institute for Scientific Information) journals (as the first author) and two peer reviewed conference papers (as the first author) submitted with the consent of advisor.

Courses

ENGR 501. Energy, Resources and Policy. 3 Credits.
Structured discussions of energy, resources and policy issues, related to energy security and national and global well-being, based on selected readings. Prerequisite: Consent of instructor.

ENGR 502. Alternative Energy Systems. 3 Credits.
Provides an interdisciplinary background in alternative energy systems. Any form of energy production different from traditional fossil fuel combustion falls in this category. Such alternate systems include energy production from biomass, gasification of wood and coal, geothermal energy, solar energy (wind energy, fuel cells, and photovoltaics), etc. Prerequisite: Consent of instructor.

ENGR 556. System Dynamics I. 3 Credits.
This course provides an introduction to the System Dynamics field of study which is a computer-aided approach to improving system performance through policy analysis and design. The knowledge and critical thinking skills gained from this course will enable students to work either independently or on interdisciplinary teams to effectively deal with problems arising from dynamically complex systems. Topics include: perspective and process; tools for systems thinking; the dynamics of growth; tools for modeling dynamic systems; instability and oscillation; model testing; and challenges for the future. F.

ENGR 558. System Dynamics II. 3 Credits.
This course builds on ENGR 556 System Dynamics I. This course will enable students to effectively plan and manage System Dynamics projects by providing knowledge and skill relating to advanced modeling techniques, software capabilities, and client engagement processes. Topics include: model building, documentation and presentation best practices; use of historical data; model calibration and testing techniques; advanced software features; group model building; and implementation challenges. Prerequisite: ENGR 556. S.

ENGR 562. Seminar in Engineering. 1 Credit.
Conference and reports on current developments in Engineering. Prerequisite: Admission to the Engineering Ph. Repeatable to 3 credits. S/U grading.

ENGR 590. Special Topics in Engineering. 1-6 Credits.
Investigations of special topics in engineering dictated by students and faculty interests. Repeatable. Prerequisite: Consent of instructor. Repeatable.
ENGR 599. Doctoral Research. 1-15 Credits. Repeatable to 60 credits. Repeatable.
ENGR 998. Thesis. 1-9 Credits. Repeatable to 9 credits. Repeatable to 9 credits.
ENGR 999. Dissertation. 1-18 Credits. Repeatable to 18 credits. Repeatable to 18 credits.

Master of Engineering (M.Eng.)
Mission Statement and Program Goals
The mission of the Chemical Engineering Master of Engineering program is to prepare chemical engineers for careers in industry or government. This preparation will be customized to meet specific areas of interest to the student with an emphasis on engineering design.

Goal 1: Graduates will have mastered selected topics in chemical engineering and related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient at engineering design, with the ability to solve complex chemical engineering problems.

Goal 3: Graduates will be well prepared for a career in industry or government in chemical engineering or a related field.

Chemical Engineering Combined Degree
To encourage undergraduate engineering students to extend their studies to include a graduate degree, the College of Engineering and Mines has a combined program that permits students to earn both a bachelor’s and a master’s degree in an engineering discipline. This program allows students to designate two three-credit graduate courses to count for both degrees. The selected courses must have graduate course standing and be designated when a student requests admission to the program.

Students may be admitted to the Chemical Engineering Combined Degree program after the completion of 95 credit hours toward the bachelor’s degree with a GPA of at least 3.3 and before completion of the bachelor’s degree. The student is admitted to the School of Graduate Studies on completion of 125 credit hours for the bachelor’s degree.

Doctor of Philosophy (Ph.D.)
Mission Statement and Program Goals
The mission of the Chemical Engineering Ph.D. program is to prepare students for research careers in industry, government and academia using chemical engineering principles to develop energy and material resources for the benefit of society.

Goal 1: Graduates will have mastered fundamental topics in chemical engineering and be able to apply them to research problems of practical significance.

Goal 2: Graduates will be proficient researchers, i.e., they will have the skills required to formulate, assess, and effectively communicate a hypothesis to a technically literate audience.

Goal 3: Graduates will be proficient at designing, conducting, and managing an independent research project.

Goal 4: Graduates will be well prepared for a career in industry, government, or academia in the field of chemical engineering.

Master of Science (M.S.)
Mission Statement and Program Goals
The mission of the Chemical Engineering Master of Science program is to prepare chemical engineers for careers in industry, government and doctoral studies in chemical engineering or related fields. This preparation will be customized to meet specific areas of interest to the student and for which the faculty is qualified to manage and instruct.

Goal 1: Graduates will have mastered selected topics in chemical engineering and related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient researchers, i.e., they will have the skills required to formulate, assess, and effectively communicate a hypothesis to a technically literate audience.

Admissions Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in chemical engineering from an ABET accredited program. Students applying for the combined BSChE/MS degree should see the “Chemical Engineering Combined Degree (https://curprocess.und.edu/engineeringandmines)” section for additional details. Students holding a B.S. degree in a science or other engineering field may be admitted to Qualified Status with an obligation to acquire a background in chemical engineering.

2. An overall undergraduate GPA of at least 2.75 or a GPA of at least 3.00 for the last two years. (An overall GPA of at least 3.3 for the combined BSChE/MS degree is required).
3. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
4. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the Graduate catalog.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemical Engineering Department.

Thesis Option:
- A minimum of 30 semester credits, including the credits granted for the thesis and the research leading to the thesis.
- At least one-half of the credits must be at or above the 500-level.
- A maximum of nine semester credits may be transferred from another institution.
- A thesis documenting research on a topic related to chemical engineering.

Non-Thesis Option:
- At least 21 credits of coursework from chemical engineering and related fields, which may include a minor or cognate.

Total Credits

Non-Thesis Option: 30

Master of Engineering (M.Eng.)

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in chemical engineering from an ABET accredited program with a GPA of at least 3.0 or a M.S. degree in chemical engineering with a GPA of at least 3.0. Students holding a B.S. degree in a science or other engineering field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
3. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Engineering degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemical Engineering Department. The general degree requirements for the Master of Engineering degree set forth by the Chemical Engineering Department include:

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 562</td>
<td>Seminar in Chemical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>CHE 591</td>
<td>Research</td>
<td>3</td>
</tr>
<tr>
<td>CHE 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
</tbody>
</table>

At least 21 credits of coursework from chemical engineering and related fields, which may include a minor or cognate.

Total Credits 30

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in chemical engineering from an ABET accredited program with a GPA of at least 3.0 or a M.S. degree in chemical engineering with a GPA of at least 3.0. Students holding a B.S. degree in a science or other engineering field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. Successful completion of an oral comprehensive exam when at least 45 post baccalaureate credits have been completed. This exam will be based on the four core chemical engineering courses and their application to the student’s research. The exam will be administered by at least three faculty members from the Department of Chemical Engineering. Candidates who fail the exam will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial exam attempt.
3. Students must present to their advisory committee an annual oral progress report describing research progress.
4. Preparation and defense of a dissertation documenting original and independent research on a topic related to chemical engineering.

Degree Requirements

1. A minimum of 90 semester credits, including acceptable master’s degree work and credits granted for the dissertation and the research leading to the dissertation.
2. Successful completion of an oral comprehensive exam when at least 45 post baccalaureate credits have been completed. This exam will be based on the four core chemical engineering courses and their application to the student’s research. The exam will be administered by at least three faculty members from the Department of Chemical Engineering. Candidates who fail the exam will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial exam attempt.
3. Students must present to their advisory committee an annual oral progress report describing research progress.
4. Preparation and defense of a dissertation documenting original and independent research on a topic related to chemical engineering.

Required Courses

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 501</td>
<td>Advanced Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>CHE 509</td>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHE 511</td>
<td>Advanced Chemical Engineering Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>CHE 515</td>
<td>Design of Engineering Experiments</td>
<td>3</td>
</tr>
<tr>
<td>CHE 562</td>
<td>Seminar in Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHE 591</td>
<td>Research</td>
<td>3-6</td>
</tr>
<tr>
<td>CHE 999</td>
<td>Dissertation</td>
<td>12</td>
</tr>
</tbody>
</table>

At least 9 credits of graduate coursework from outside chemical engineering, which may contribute to a minor or cognate.

Additional graduate coursework 9-18

Successful completion of the four core chemical engineering courses with a GPA of at least 3.3.
Courses

CHE 515. Design of Engineering Experiments. 3 Credits.
Design and analysis of experimental data including block and factorial arrangements, significance of data, and mathematical modeling. Prerequisite: MATH 265.

CHE 520. Impurities in Combustion and Gasification Systems. 3 Credits.
This course is on the fate and behavior of fuel derived impurities in energy conversion systems and how impurities influence system design, operation and reliability. Prerequisite: CHEM 122.

CHE 525. Polymer Engineering. 3 Credits.
Basic polymer structures and characterization, Polymerization reactions and kinetics of condensation and chain growth polymerizations, Polymerization processes including bulk, suspension, solution, and emulsion polymerizations, Polymer processing technologies including extrusion, and injection molding. Prerequisites: CHE 321 and CHE 301.

CHE 530. Combustion Theory and Modeling. 3 Credits.
A theoretical and mathematical study of premixed and diffusion flames, laminar and turbulent combustion, solid fuel combustion and pollutant formation. Prerequisites or Corequisites: CHE 301 and CHE 303.

CHE 531. Rocket Propulsion. 3 Credits.
A theoretical and mathematical study of space flight, the thermodynamics of rocket propulsion, classification and formulation of propellants and their combustion characteristics, and rocket motors. Prerequisite or corequisite: CHE 303.

CHE 532. Explosives: Theory and Modeling. 3 Credits.
A theoretical and mathematical study of the thermodynamics of deflagrations and detonations, classification and formulation of explosives and their combustion characteristics. Prerequisite or Corequisite: CHE 303.

CHE 535. Metallic Corrosion and Polymer Degradation. 3 Credits.
Reviews the forms of metal corrosion and of polymer degradation; discussion of control and mitigation techniques.

CHE 562. Seminar in Chemical Engineering. 1 Credit.
Conferences and reports on current developments in Chemical Engineering. Repeatable to 3 credits. S/U grading.

CHE 591. Research. 1-15 Credits.
Analysis, planning, and detailed study of definite problems; individual laboratory work on some selected problems to develop the power of independent investigation. Repeatable.

CHE 593A. Special Topics. 1-3 Credits.
Topics of current interest to be considered each semester. Regular grading. Repeatable to 9 credits.

CHE 593B. Special Topics. 1-3 Credits.
Topics of current interest to be considered each semester. S/U grading. Repeatable to 3 credits. S/U grading.

CHE 595. Design Project. 3-6 Credits.
A three to six credit course of engineering design experience involving individual effort and formal written report. Prerequisite: Restriction to the Master of Engineering students and subject to approval by the student's advisor.

CHE 597. Graduate Cooperative Education. 1-2 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department, and employer. Prerequisite: Approval of CHE graduate director. Repeatable to 4 credits. S/U grading. On demand.

CHE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CHE 997. Independent Study. 2 Credits.

CHE 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Chemical Engineering at the master's level. Repeatable to 9 credits. F,S,SS.

CHE 999. Dissertation. 1-12 Credits.
Repeatable to 12 credits. F,S,SS.

Civil Engineering

http://engineering.und.edu/civil/

Faculty: Gedafa, Jerath (Chair and Graduate Director), Lim, Mamaghani, Suleiman, and Xiao

Degrees Granted: Master of Science (M.S.), Master of Engineering (M. Engr.) and Doctor of Philosophy (Ph.D.)

The Department of Civil Engineering offers graduate programs leading to the Master of Engineering degree, the Master of Science degree and the Doctor of Philosophy degree. The Master of Engineering degree permits specialization in the following options: soils-structures engineering, environmental engineering, water resources engineering, and general civil engineering. The Master of Engineering degree program is designed to provide an opportunity for engineers to achieve formal education beyond the Baccalaureate level with a strong and directed emphasis toward the practice of engineering. The focus of the program is on the development of competency in the area of engineering design. The goal of the program is development of the student as a practitioner capable of systematically solving complex problems of society within his or her field.
The Master of Science degree in Civil Engineering prepares students for careers in research, practice and further studies toward a Ph.D. degree in a specialty area of civil engineering. The M.S. degree is typically completed in 18-24 months of full-time study for students holding a bachelor’s degree in civil engineering from an accredited school. The M.S. degree requires independent research for a thesis in the student’s area of interest. The faculty research interests are in the broad areas of environmental, geotechnical, pavements, structural engineering and mechanics, and water resources engineering. Graduates are encouraged to explore various topics for their M.S. theses depending on the mutual interest between them and the faculty.

The Department offers combined Bachelor of Science in Civil Engineering/Master of Engineering, and Bachelor of Science in Civil Engineering/Master of Science degree programs. The purpose of the combined program is to allow qualified students to complete requirements for both a baccalaureate degree and a master’s degree in 12 to 18 months beyond the time required to complete the baccalaureate degree. See Combined Degree Program (p. 618) under the College of Engineering and Mines section for additional details.

The Department of Civil engineering also participates in an interdisciplinary Ph.D. Engineering Program. See Ph.D. Program (p. 618) under the College of Engineering and Mines section or contact the Civil engineering Department.

Details pertaining to admission requirements, degree requirements and courses offered can be found on the Degrees section.

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Master of Science program in Civil Engineering is to prepare students for careers in private and public practice of civil engineering and for advanced study in the field of civil engineering. The major emphasis of the program is to foster a deeper understanding of the engineering research process. Students in the program usually specialize in environmental engineering, structural engineering, water resources engineering, or pavement materials engineering.

Goal 1: Students will build on knowledge gained in their undergraduate program of study to achieve a fuller understanding of civil engineering and the engineering research process.

Goal 2: Students will perform a detailed research project in a specific focus area related to civil engineering.

Goal 3: Graduates will be prepared for a career in private or public practice in civil engineering and related fields and for further advanced study in the field of civil engineering.

Master of Engineering (M.Engr.)

Mission Statement and Program Goals

The mission of the Master of Engineering program in Civil Engineering is to prepare students for careers in private and public practice of civil engineering and related fields. The major emphasis of the program is to foster a deeper understanding of the engineering design process. The program has four main options. These are soils-structures engineering, environmental engineering, water resources engineering, and general civil engineering.

Goal 1: Students will build on knowledge gained in their undergraduate program of study to achieve a fuller understanding of civil engineering and the engineering design process.

Goal 2: Students will perform a detailed design project in a specific focus area related to civil engineering.

Goal 3: Graduates will be prepared for a career in private or public practice in civil engineering and related fields.

Doctor of Philosophy in Engineering (Ph.D.)

Mission Statement and Program Goals

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Civil Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings.

Goal 1: Graduates will have a depth of knowledge in civil engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

Goal 3: Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in civil engineering or a related field.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Minimum general admission requirements in the Admission section of the graduate catalog.
2. A baccalaureate degree in engineering or science from a recognized college or university.
3. Graduate Record Examination scores on the General Test will be required for those holding undergraduate degrees from other than ABET-accredited programs.
4. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A = 4.00).
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Civil Engineering Department.

Degree requirements will be those listed by the School of Graduate Studies for the M.S. degree, both for the thesis option and the non-thesis option. There are no specific departmental degree requirements beyond those listed in the graduate catalog for the M.S. degree.

Thesis Option:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
4. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include 20 credits from the
major department, and a minor or cognate area must include at least nine credits.
5. Preparation of a written thesis approved by the faculty advisory committee
   (ME 998 Thesis, 4-9 credits).
6. Comprehensive final examination.

Non-Thesis Option:
1. Thirty-two (32) credits including credits required for the major.
2. A minimum of two credits of Independent Study.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours
   required for the degree may be transferred from another institution.
5. Preparation of a written independent study report approved by the faculty
   advisor (ME 997 Independent Study, 2 credits).
6. Comprehensive final examination.

Course offerings vary by semester based on student demand and instructor loads.

Master of Engineering (M. Engr.)

Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in Civil Engineering from an ABET accredited
   or equivalent program.
2. Graduate Record Examination General Test for applicants from non-ABET
   accredited programs.
3. A cumulative Grade Point Average (GPA) of at least 2.5 for all
   undergraduate work or a GPA of at least 3.0 for the junior and senior years
   of undergraduate work (based on A = 4.00).
4. Satisfy the School of Graduate Studies’ English Language Proficiency
   requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Engineering degree at the University of
North Dakota must satisfy all general requirements set forth by the School
of Graduate Studies as well as particular requirements set forth by the Civil
Engineering Department.

1. A minimum of 30 semester credits in a major option, including the credits
   granted for the design project and the research leading to the design
   project.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may
   be transferred from another institution.
4. Preparation of a written design project approved by the faculty advisor.
5. Comprehensive final examination.
6. Required Courses:
   **Soils-Structures Option**
   - CE 501 Mechanics of Materials II 3
   - CE 502 Structural Stability 3
   - ME 529 Advanced Finite Element Methods 3
   - CE 595 Design Project 6
   - Electives 15

   **Environmental Option**
   - CE 531 Environmental Engineering III 3
   - CE 532 Environmental Engineering IV 3
   - CE 533 Industrial Wastes 3
   - or CE 535 Hazardous Waste Management 3
   - CE 595 Design Project 6
   - Electives 15

   **Water Resources Option**
   - CE 523 Applied Hydraulics 3
   - CE 524 Open Channel Hydraulics 3

   **General Civil Engineering Option**
   - CE 501 Mechanics of Materials II 3
   - CE 523 Applied Hydraulics 3
   - CE 531 Environmental Engineering III 3
   - CE 595 Design Project 6
   - Electives 15

Combined Degree
To encourage undergraduate engineering students to extend their studies to
include a graduate degree, the College of Engineering and Mines has a
combined program that permits students to earn both a bachelor’s and master’s
degree in an engineering discipline. This program allows students to designate
two three-credit graduate courses (usually 4-9 credits) for both degrees. The selected
courses must have graduate course standing and be designated when a
student requests admission to the program.

Students may be admitted to the Civil Engineering Combined Degree program
after the completion of 95 credit hours toward the bachelor’s degree with a GPA
of at least 3.3 and before completion of the bachelor’s degree. The student is
admitted to the School of Graduate Studies on completion of 125 credit hours
for the bachelor’s degree.

Doctor of Philosophy (Ph.D.)

Admission Requirements
1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or
   higher or a Master of Science degree in an engineering discipline with a
   GPA of 3.0.
2. Satisfy the School of Graduate Studies’ English Language Proficiency
   requirements as published in the Graduate Catalog.
3. In addition to meeting the general provisions in the UND graduate catalog
   and the minimum requirements in items 1-2 above, candidates are
   assessed using a holistic process that considers Student’s Record of
   Publications, GRE test scores (for students who are applying with a B.S.
   engineering degree from a non-ABET accredited program), transcripts of
   previous college work, relevant research and work experience, letters of
   recommendation, research interests, and English language skills. Students
   must specify a track on their admission form to facilitate this evaluation.
4. A student holding a non-engineering degree or who does not meet the
   minimum requirements in items 1-2 above may apply to one of the Master
   of Science degree programs in the College of Engineering and Mines.
   Students successfully completing a UND M.S. engineering degree will be
   considered to satisfy the requirements of items 1-2 above; however, these
   students shall still be subject to the holistic evaluation process described in
   item 3 with the exception that new GRE test scores will not be required.
5. Students admitted to an engineering M.S.C.E. program but meeting the
   minimum requirements in items 1-2 above, may after one calendar year
   and upon the recommendation of his/her advisory committee, request to
   by-pass the master’s degree and work directly toward the Ph.D. degree.
   The recommendation of the advisory committee shall be brought to a
   vote by the program graduate committee relevant to the degree track
   requested by the student. A minimum of one week before such a meeting,
   the program graduate committee shall be notified and provided with
   the student’s updated file which shall consist of the materials used for
   application into the M.S.C.E. program, a transcript of all academic work
   completed at UND, and any additional materials the student wishes to have
   considered. If the recommendation is approved by the relevant graduate
   committee, the student will be given the qualifying exam. Passing this exam
   will advance the student to Approved Status in the Doctoral Program in
   Civil Engineering.

Residence Requirements
The purpose of residence requirements is to provide an opportunity for a
sustained and concentrated intellectual effort, to provide for immersion in an
academic research environment, and to permit extensive interaction with fellow
students and faculty of the Civil Engineering Department. Within the first two years of graduate work at UND, at least two consecutive semesters must be completed in residence. During residency, a student must be registered for at least nine credits in a semester, or be a graduate research or teaching assistant taking the appropriate credits to qualify as a full-time student. The remainder of the credits required for a degree can be completed in a manner to accommodate the student’s fiscal, family, job related, and other constraints with the consent of the student’s adviser. The program of study must be completed within the seven-year period normally allowed for graduate programs.

Under special circumstances, the student in conjunction with his/her advisory committee and the Civil Engineering Graduate Committee, can petition the Dean of the School of Graduate Studies for variances in this policy.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Civil Engineering Doctoral Program.

The following requirements are in addition to the UND School of Graduate Studies general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the CE 562-Graduate Seminar must be taken.
7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this graduate catalog). The coursework shall include a minimum of 27 credit hours of Civil Engineering (or relevance courses with the consent of the student’s advisor and advisory committee) coursework selected from the approved list of CE Ph.D. track courses published in the UND Academic Catalog. Equivalent graduate level coursework may be transferred from a master’s program.
8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. The qualifying examination includes the following three sections.

Section I

A written qualifying examination will cover four general areas of the student’s selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty advisor and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II

A detailed written doctoral research proposal must be submitted to the advisory committee. The proposal should cover:

1. a literature review of the relevant field of research related to the project
2. proposed methods
3. preliminary results (simulation or experiment)
4. the objectives of the proposed project, and
5. tasks and the timeline of the proposed research in a Gantt chart.

The proposal should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the proposal should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written proposal exam, student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the proposal exam earns a passing grade, a date can be scheduled for an oral comprehensive examination (i.e., Section III). If failed, student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III

An oral comprehensive examination is completed when at least 30 credit hours of post baccalaureate coursework has been completed. The oral comprehensive examination will follow a formal presentation by the student to the advisory committee on the research topics described in the above section (II-A to II-E) and will be based significantly on the core of the individual student’s program of study and his/her formal research presentation. Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam no later than 6 months after the initial examination attempt as specified by the student committee. A student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

1. After successful completion of the written research proposal and oral presentation and examinations, an annual oral progress report should be presented to the advisory committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.
2. CE 562 Graduate Seminar may serve as the venue for the annual oral progress reporting.
3. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research advisor and the advisory committee and will prepare a written dissertation covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed research journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists of the PhD committee and an external examiner from outside the University. The external examiner is selected by the department’s graduate committee from a list of three candidates proposed by the advisor. The external examiner should not have any common publication with the student’s advisor or student and can be from academia or industry with an expertise relevant to the student’s research. The student and advisor should not contact the external examiner directly before or after.
4. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.coursesleaf.com/graduatetudies)). Four results of the examination can be obtained: 1) pass; 2) minor revision 3) major revision and 4) fail. For minor revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a PhD degree and may request to be reclassified as a master’s student and complete a Master of Science degree.
5. At least one peer reviewed journal article (as the first author) and one peer reviewed conference paper (as the first author) must be submitted with the consent of the advisor.
Courses

CE 501.* Mechanics of Materials II. 3 Credits.
Analysis of stress and strain, theories of failure, inelastic material behavior, energy methods, torsion of noncircular and thin-walled sections, unsymmetrical bending, shear center, curved beams. Prerequisite: ENGR 203.

CE 502.* Structural Stability. 3 Credits.
Stability of columns, beam-columns and frames, inelastic buckling, critical loads by the energy method, torsional buckling. Prerequisite: ENGR 203.

CE 503.* Structural Dynamics. 3 Credits.
Single-degree and multi-degree of freedom structures, continuous systems, earthquake response of linear elastic buildings, structural dynamics in building codes, base isolation. Prerequisites: ENGR 202 and ENGR 203.

CE 517. Transportation Asset Management. 3 Credits.
Course focused on principles of transportation asset management with an emphasis on pavement management system (PMS). Network and project level pavement management processes will be discussed, but the emphasis will be on network-level. Bridge management system will also be covered. Prerequisites: ENGR 203 and a statistics course (MATH 321, ECON 210, PSYC 241 or approved substitute). F.

CE 518. Pavement Engineering. 3 Credits.
Structural pavement design concepts for flexible and rigid pavements; traffic and environmental loading factors; material characterization; hot mix asphalt design and analysis concepts. SuperPave mix design method, stresses and strains in flexible and rigid pavements, joints and load transfer of rigid pavements, fast track concrete, and construction issues. Prerequisite: CE 412; consent of instructor for undergraduate students. F.

CE 519. Sustainable Pavements. 3 Credits.
Sustainability concepts; overview of mix design, structural design, and construction methods of pavements; warm mix asphalts; recycling of asphalt and concrete pavements, perpetual pavement concepts, specialty pavements, environmental, economic, and social impacts of highway pavements. Prerequisite: CE 412; consent of instructor for undergraduate students. S.

CE 523.** Applied Hydraulics. 3 Credits.
Study of advanced topics in hydraulics. Computer applications. Content will vary. Repeatable to 9 credits when topics vary. Prerequisite: CE 423. Repeatable to 9 credits.

CE 524.** Open Channel Hydraulics. 3 Credits.
Study of advanced topics in open channel hydraulics. Computer applications. Prerequisite: CE 423.

CE 525. Surface Hydrology. 3 Credits.
Extreme rainsfalls and flood frequency analysis, regionalization; runoff generations, routings, and basin modeling; urban storm water design; GIS and remote sensing applications in hydrology; recent techniques and development in surface hydrology. Prerequisite: CE 421.

CE 531.* Environmental Engineering III. 3 Credits.
Unit Operation and process design for water and wastewater treatment; physical, chemical, and biological systems; plant design project, computer-assigned design analysis. Content emphasis will vary. Prerequisite: CE 431.

CE 532.** Environmental Engineering IV. 3 Credits.
Advanced theory and special methods in municipal and industrial water and wastewater treatment including treatment plant control, equipment studies, nutrient removal, tertiary treatment and toxic pollutants control. Content emphasis will vary. Prerequisite: CE 431.

CE 533.* Industrial Wastes. 3 Credits.
Industrial processes and waste characterization, regulatory law, specialized treatment systems, hazardous wastes, economic analysis; plant tours of potato, sugar, meat, dairy, paper and pulp products and metal plating industries. Prerequisite: CE 431.

CE 535.** Hazardous Waste Management. 3 Credits.
Regulations, generation, storage, transportation, disposal, classification, fate and transport of contaminants, environmental audits, pollution prevention and management facilities, remediation alternatives, physical-chemical treatment, bioremediation, stabilization/solidification, thermal processes. Prerequisites: CE 306 and CHEM 121.

CE 551.* Plate and Slab Structures. 3 Credits.
Classical plate bending theory, rectangular and circular plates, slab analysis by energy and numerical methods, anisotropic plates, large deflection theory, buckling of thin plates. Prerequisites: ENGR 203 and CE 351.

CE 552.* Thin Shell Structures. 3 Credits.
Differential geometry of shell theory, membrane and bending theories of shells, shells of revolution, stress analysis of domes, pressure vessels, and storage tanks, numerical methods, buckling of shells. Prerequisites: ENGR 203 and CE 351.

CE 555.* Prestressed Concrete-Analysis and Design. 3 Credits.
Materials and methods of prestressing, loss of prestress, flexural design by service load and ultimate-strength methods, anchorage zone stresses, shear and torsion design. Prerequisite: CE 453.

CE 556. Numerical and Matrix Methods of Structural Analysis. 3 Credits.
Methods of successive approximations and numerical procedures for solution of complex structural problems, matrix formulation of structural problems, flexibility and stiffness methods of analysis. Prerequisite: CE 351.

CE 557. Advanced Steel Design. 3 Credits.
Design and analysis of simple structural connections including both moment and shear connections; design and analysis of eccentric structural connections, plate girders, and composite structures; design and analysis for seismic loads; ASD and LRFD design. Prerequisite: CE 451; consent of instructor for undergraduate students. F.

CE 558. Theory of Plasticity. 3 Credits.
Rigorous study of classical theory of plasticity. Classical continuum mechanics concepts of stress and strain and elastic behavior discussed. Progressing into plastic behavior in materials, mathematical formulation of elasto-plastic constitutive relationship, practical engineering limit analysis, and application of plasticity theories in analysis using computer programs. Prerequisite: CE 451 or instructor approval; consent of instructor for undergraduates. S.

CE 562. Graduate Seminar in Civil Engineering. 1 Credit.
Conference and reports on current developments in Civil Engineering. Prerequisite: Admission to Civil Engineering Program; consent of instructor and School of Graduate Studies. Repeatable to 3 credits. S/U grading. F.S,SS.

CE 590. Special Topics. 1-6 Credits.
Investigation of special topics dictated by student and faculty interests. May be repeated up to a total of 6 credits. Prerequisite: Department approval. Repeatable to 6 credits.

CE 591. Civil Engineering Research. 1-12 Credits.
May be repeated to a maximum of 12 credits. Repeatable to 12 credits.

CE 595. Design Project. 3-6 Credits.
A three to six credit course of engineering design experience involving individual effort and formal written report. Repeatable to 6 credits. Prerequisites: Restricted to the Master of Engineering student candidate and subject to approval by the student's advisor. Repeatable to 6 credits.

CE 599. Doctoral Research. 1-15 Credits.
Research contributing to the discovery and dissemination of knowledge and/or technology in Civil Engineering and contributing to the student's doctoral dissertation. Prerequisite: Admission to the PhD in Civil Engineering Program. Repeatable. F.S,SS.

CE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CE 997. Independent Study. 2 Credits.

CE 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Civil Engineering at the master's level. Repeatable to 9 credits. Repeatable to 9 credits.

CE 999. Dissertation. 1-18 Credits.
PhD student doctoral dissertation. Prerequisite: Admission to the PhD in Civil Engineering Program. Repeatable to 18 credits. S/U grading. F,S,SS.

* Structural students must take 4 core courses from this group.
** Water Resources/Environmental students must take 4 courses from this group.

Undergraduate Courses for Graduate Credit

CE 412. Soil Mechanics. 3 Credits.
Course topics include principles of soil mechanics including weight-volume relationships, classification, compaction, effective stress, permeability and seepage, consolidation, shear strength, site exploration, introduction to lateral earth pressure, and slope stability. Prerequisite: ENGR 203. F.
Mission Statement and Program Goals

The mission of the Department of Electrical Engineering is to educate, inspire, and enhance the competitiveness of our graduates through integration of teaching and collaborative research focused on scientific innovation and discovery.

Graduates will be prepared for careers in private industry, government, and academia, in electrical engineering or related fields.

**Goal 1:** Students will develop a comprehensive and in-depth understanding of electrical engineering through graduate-level coursework.

**Goal 2:** Students will develop critical thinking skills through research activities or focused project activities.

**Goal 3:** Students will develop skills to communicate the results of their research in an effective and professional manner.

Doctor of Philosophy (Ph.D.)

Program Description

The Doctor of Philosophy in Electrical Engineering program provides a student with specialized training customized to meet his or her specific interests and goals. Faculty advisors work with each student to structure a graduate program consisting of traditional engineering study, complementary multidisciplinary studies, strong interaction between fellow engineering students, and high-quality research. The program is based upon the research strengths of faculty and includes studies in the major engineering disciplines.

The program includes a significant research component characterized by substantial interaction between the student and the advisor. Research topics are determined based upon the mutual interest of the student and research advisor. Students develop a strong research methodology and apply this research method to a specific engineering problem as directed by the advisor. Student’s attendance is required at a weekly seminar. This seminar is used to enhance the research methodology by allowing students to present their research during various stages of development.

Mission Statement and Program Goals

The program recognizes that effective researchers should have extensive expertise in Electrical Engineering coupled with a familiarity and awareness of related research needs and the context for applying that expertise. A principal goal of the program is to train electrical engineering Ph.D. researchers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings.

**Goal 1:** Graduates will have a depth of knowledge in electrical engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

**Goal 3:** Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in electrical engineering or a related field.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in Electrical Engineering or closely related field. Students holding B.S. degrees in other fields, e.g., physics, mathematics, and computer science, may be admitted to Provisional or Qualified status until selected undergraduate requirements in electrical engineering have been satisfied.
2. An overall undergraduate GPA of at least 2.75 or a GPA of at least 3.00 for the last two years.
3. Applicants holding degrees from non-ABET accredited programs/universities must submit scores from the General Test of the Graduate Record Examination.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
Degree Requirements

Thesis Option:

1. A minimum of 30 semester credits, including credits granted for the thesis.
2. A minimum of 21 semester credits, including 6 thesis credits, must be in the major field of electrical engineering.
3. A minor field of study can be obtained by completing 9 semester credits from another department that offers a graduate program. A graduate faculty member from that department must serve on the thesis committee.
4. A cognate can be obtained by completing 9 semester credits from more than one department outside of electrical engineering, or from a single department that does not offer a graduate program.
5. At least one-half of the credits must be at or above the 500-level.
6. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
7. Completion of a research project and its presentation in a thesis.
8. An overall GPA of 3.00 or better in all coursework.
9. The thesis course (EE 998) can be between 6-9 credits with approval of the thesis committee.
10. At least one credit of seminar class (EE 570) is mandatory for each MS coursework.
11. At least two peer-reviewed applications (as first author) submitted with the consent of student's advisor before the time of defense.

Non-Thesis Option:

1. Completion of at least 32 semester credits, including credits required for the major.
2. A minimum of 2 credits of Independent Study
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written Independent Study report approved by the faculty advisor.
6. Comprehensive final examination.
7. An overall GPA of 3.00 or better in all coursework.
8. At least one peer-reviewed manuscript (conference, journal, or patent application as the first author) submitted with the consent of student's advisor.

Master of Engineering (M.Eng.)

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in Electrical Engineering or closely related field. Students holding B.S. degrees in other fields, e.g., physics, mathematics, and computer science, may be admitted to Provisional or Qualified status until undergraduate requirements in electrical engineering have been satisfied.
2. An overall undergraduate GPA of at least 2.5 or a GPA of at least 2.75 for the last two years.
3. Applicants holding degrees from non-ABET accredited programs/ universities must submit scores from the General Test of the Graduate Record Examination.
4. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

1. Course necessary for basic-level ABET accreditation. Normally, graduation from an ABET-accredited institution will satisfy this requirement.
2. A program of study must include the following:
   a. A minimum of 30 semester credit hours.
   b. Three to Six (3-6) semester credit hours of an approved design project (EE 595 Design Project).
3. An overall GPA of 2.75 or better for all coursework.
4. Complete the approved design project.
5. Pass a comprehensive written examination.
6. one peer reviewed manuscript (as first author, such as conference paper, journal paper or patent application) submitted with the consent of advisor.

Combined Degrees

Bachelor of Science/Master of Science or Master of Engineering

Admission Requirements for B.S./M.S. or B.S./M.Eng. Degree

1. Students may apply for this program upon completion of 95 credits toward the bachelor’s degree.
2. An overall undergraduate GPA of 3.0 at the time of admission.
3. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.
4. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Degree Requirements for B.S./M.S. or B.S./M.Eng. Degree

Students seeking the Master of Science or Master of Engineering degree through the Combined Degree program at the University of North Dakota must satisfy all requirements for both the B.S. and M.S. degree. A maximum of six credits of prior approved coursework can get double counted toward each of the two degrees. Double counted courses may not include required courses for the B.S.E.E. degree, but may include technical or electrical engineering elective coursework, preferably at the 500-level or above.

Degree requirements for the M.S. or M.Eng. degree will be those listed by the School of Graduate Studies as found in the graduate school catalog.

Doctor of Philosophy (Ph.D.)

Admission Requirements

1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or higher or a Master of Science degree in an engineering discipline with a GPA of 3.0.
2. Satisfy the Graduate School’s English Language Proficiency requirements as published in the Academic Catalog.
3. In addition to meeting the general provisions in the UND Academic Catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers Student's Record of Publications, GRE test scores (for students who are applying with a B.S. engineering degree from an non-ABET accredited program), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.
4. A student holding a non-engineering degree or who does not meet the minimum requirements in items 1-2 above may apply to one of the Master of Science degree programs in the College of Engineering and Mines. Students successfully completing a UND M.S. engineering degree will be considered to satisfy the requirements of items 1-2 above; however, these students shall still be subject to the holistic evaluation process described in item 3 with the exception that new GRE test scores will not be required.
5. Students admitted to an engineering M.S.E.E. program but meeting the minimum requirements in items 1-2 above, may alter one calendar year, and upon the recommendation of his/her advisory committee, request to...
The following requirements are in addition to the UND graduate school general requirements set forth by the Graduate School Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School and provide a presentation during each visit. One of these presentations can be in distance delivery mode, the student must have a minimum of three campus visits per year of residence. The qualifying examination includes the following three sections.

Section I
It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty advisor and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of "provisional pass" for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II
A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:

a. a literature review of the relevant field of research related to the project
b. proposed methods
c. preliminary results (simulation or experiment)
d. the objectives of the proposed project, and
e. tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written exam, the student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade, a date can be scheduled for an oral presentation (i.e., Section III). If failed, the student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III
An oral comprehensive examination should be presented to the committee on the research topics described in the above section (II-A to II-E). Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of "provisional pass" will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than 6 months as specified by the student committee. A student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Residence Requirements
The Ph.D. program in Electrical Engineering provides an opportunity for sustained and concentrated intellectual efforts. In both campus and distance delivery modes, the Electrical Engineering faculty advisor and advisory committee members must maintain regular interactions with Ph.D. student. For campus delivery mode, the student is required to have residency of at least two consecutive semesters. During residency, the student must be registered for at least nine credits in a semester, or be a graduate research or teaching assistant taking the appropriate credits to qualify as a full-time student. As an alternative, students utilizing the distance delivery program can meet the residency requirement by demonstrating their research activities are coordinated with their advisor and advisory committee and are being performed in an environment that provides meaningful intellectual interactions on a regular basis. This may be provided through their place of employment, through interactions with a national lab or other recognized research facility/university, by interfacing with a private of public industry, hospital, or other similar venue.

The student will be responsible for including the nature of their interactions as a part of their research plan for approval as meeting residency requirements. For distance delivery mode, the student must have a minimum three campus visits and provide a presentation during each visit. One of these presentations can be the oral presentation (Section III) of the qualifying exam. Additionally, a Ph.D. candidate should be present for Ph.D. dissertation defense in person.

Degree Requirements
Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Electrical Engineering Doctoral Program.

The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. Scholarly tools course taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the EE 570-Graduate Seminar must be taken.
7. A minimum of 39 credit hours of coursework is required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this Academic Catalog). The coursework shall include a minimum of 27 credit hours of Electrical Engineering (or relevance courses with the consent of advisor) coursework selected from the approved list of courses. Equivalent graduate level coursework may be transferred from a master’s program.
8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. The qualifying examination includes the following three sections.

Section I
It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty advisor and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II
A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:

a. a literature review of the relevant field of research related to the project
b. proposed methods
c. preliminary results (simulation or experiment)
d. the objectives of the proposed project, and
e. tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written exam, the student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade, a date can be scheduled for an oral presentation (i.e., Section III). If failed, the student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III
An oral comprehensive examination should be presented to the committee on the research topics described in the above section (II-A to II-E). Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than 6 months as specified by the student committee. A student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

9. After successful completion of the written research proposal and oral presentation, an annual oral progress report should be presented to the committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.

10. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research advisor and the advisory committee and will prepare a written dissertation.
covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed research journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists of the Ph.D. committee and an external examiner from outside the University. The external examiner is selected by the department’s graduate committee from a list of three candidates proposed by the advisor. The external examiner should not have any common publication with the student’s advisor or student and can be from academia or industry with expertise relevant to the student’s research. The student and advisor should not contact the external examiner directly before or after.

11. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.coursesleaf.com/graduatemasters)). Four results of the examination can be obtained: 1) pass; 2) minor revision; 3) major revision; and 4) fail. For minor revisions there is no need for another defense session, and, upon revising the dissertation, the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a Ph.D. degree and may request to be reclassified as a master’s student and complete a Master of Science degree.

12. At least two peer reviewed ISI (Institute for Scientific Information) journals (as the first author) and two peer reviewed conference papers (as the first author) submitted with the consent of advisor.

Courses

**EE 503. Statistical Communications Theory and Signal Processing I. 3 Credits.**
Theory of time series analysis of random signals as applied to signal processing is emphasized. Prerequisite: EE 411 or consent of instructor.

**EE 504. Statistical Communications Theory and Signal Processing II. 3 Credits.**
Advanced methods of signal detection including linear parameter estimation and non-linear estimation of parameters. Detection of signals and estimation of signal parameters from a probability point of view will be emphasized.

**EE 505. Control Systems II. 3 Credits.**
Advanced topics in control systems including nonlinear systems, robust control, optimal control, and pole placement techniques; selective topics from the state of the art. Prerequisite: EE 405.

**EE 506. Digital Control Systems. 3 Credits.**
Digital systems representation, analysis and simulation; Z-transform; digital controllers design and realization; microprocessor based controllers. Prerequisite: EE 405.

**EE 507. Spacecraft Systems Engineering. 3 Credits.**
Space environment, dynamics of spacecraft, celestial mechanics, mission planning, and systems engineering methodology.

**EE 508. Intelligent Decision Systems. 3 Credits.**
Systems and networks will be designed to work in an uncertain environment. Systems will be optimized using Neural Networks and Fuzzy Logic concepts. Prerequisite: EE 314 or consent of instructor.

**EE 509. Signal Integrity. 3 Credits.**
Fundamental concepts of signal integrity are presented. Topics include propagation of digital signals, electrical noise, and system timing. Prerequisite: EE 409 or consent of instructor.

**EE 511. Power Electronics. 3 Credits.**
Principles of power electronics switching control circuits. Including AC/DC, DC/DC, DC/AC converters, their harmonics and filtering techniques, and their application in switching power supplies, electric drives, renewable energy systems, etc. Prerequisite: EE 321 or consent of instructor. On demand.

**EE 512. Wireless Communications. 3 Credits.**
Key concepts, underlying principles, and practical applications of ever-growing wireless and cellular communication technologies. Prerequisite: EE 411 or consent of instructor.

**EE 519. Digital Computer Logic. 3 Credits.**
Logic design analysis of digital computers with some applications. Prerequisite: EE 451 or consent of instructor.

**EE 520. Electronic Computing Systems. 3 Credits.**
Design of bit slice computers; simulation of computers’ special purpose controller design; advanced microprocessor design and use. Prerequisite: EE 201 and EE 421.

**EE 521. Digital Signal Processing. 3 Credits.**
Modern methods of digital signal processing will be studied. Techniques that will be used include the recursive and nonrecursive discrete-time filters and the Fourier Transform. Prerequisite: EE 314.

**EE 522. Renewable Energy Systems. 3 Credits.**
This course will provide engineering students with an understanding of the principles of renewable energy conversion systems. Emphasis is on wind, photo-voltaic, hydrogen fuel, and fuel cell energy conversion and storage systems, along with their associated design and control issues.

**EE 523. Power Systems II. 3 Credits.**
Electric power systems analysis and control. Power flow; system response and stability; voltage and frequency control; computer methods in system analysis. Prerequisite: EE 423.

**EE 524. Application Specific Integrated Circuit (ASIC) Design. 3 Credits.**
To gain an historic perspective of ASIC Design. To familiarize students with the existing IC technology and their attributes. To recognize basic fabrication process, layout, circuit extraction and performance analysis. To understand CAD tools, hardware, systems engineering, and operational issues. Prerequisite: EE 421 or consent of instructor.

**EE 525. Electromagnetic Fields. 3 Credits.**
Static electric and magnetic fields, field mapping, and applications to transmission lines, wave-guides, and antennas. Prerequisite: EE 316.

**EE 530. Phased Array Antennas. 3 Credits.**
Basic antenna and array characteristics, pattern synthesis techniques, analysis and design of radiating elements and feed networks, mutual coupling and array error analysis, adaptive arrays. Prerequisite: Consent of instructor. On demand.

**EE 532. Antenna Theory. 3 Credits.**
Physical principles underlying antenna behavior and design as applied to antennas. Prerequisite: EE 316 or consent of instructor.

**EE 534. Advanced Wireless Communications Engineering. 3 Credits.**
A combination of theory and practice underlying principles and practical applications of Wireless Communications. Prerequisite: Consent of Instructor. On demand.

**EE 536. Optical Fiber Communications. 3 Credits.**
Propagation in optical fibers, optical receivers, amplifiers, detectors, sources, transmission links, noise consideration, optical fiber communication systems, applications and future developments. Prerequisite: EE 434 or consent of instructor.

**EE 537. Graduate Cooperative Education. 3 Credits.**
A practical research experience with an employer closely associated with the student’s academic area. A written report which includes a literature survey and research findings and an oral presentation are required. Prerequisites: Approved status, 3.

**EE 539. Electromagnetic Compatibility. 3 Credits.**
Introduction to design considerations and techniques used to ensure electromagnetic compatibility. Prerequisite: EE 409 or consent of instructor.

**EE 540. Computer Networks Communications. 3 Credits.**
This course introduces fundamental concepts in the design and implementation of computer networks and their communication protocols, including the OSI model and TCP/IP protocol suite. Prerequisite: Consent of the instructor.

**EE 545. Introduction to Biomedical Engineering. 3 Credits.**
This course introduces biomedical engineering and several systems of the human physiology. Signals of biological origin obtained from these systems, biosensors, transducers and bioelectrodes used to acquire such signals, along with medical quality amplifiers for measuring bio potentials, are discussed. Prerequisite: EE 314, EE 421 or consent of instructor.

**EE 550. Biomedical Instrumentation. 3 Credits.**
Introduction to circuits and systems that allow electrical technology to interface with biological systems. Prerequisite: EE 314, EE 316 and EE 421, or consent of instructor.
EE 552. Advanced Embedded Systems Design. 3 Credits.
This course provides students with cutting-edge techniques in the design and implementation of advanced embedded systems that involve analog/digital conversion, interrupts, timers, CCP modules, and parallel/serial communications. Prerequisite: EE 452 or consent of instructor.

EE 560. Engineering Computation. 3 Credits.
Development and application of optimization techniques in practical problems encountered in electrical engineering, Downhill and probabilistic optimization techniques, Modeling of complex systems by partial differential equations and their numerical solution by finite difference and finite element methods. Prerequisite: Consent of instructor. On demand.

EE 570. Seminar. 1 Credit.
The purpose of the course is to practice communication skills in writing papers and preparing presentations. Open to qualified advanced undergraduate students and graduates. Repeatable to 3 credits. On demand.

EE 590. Advanced Electrical Engineering Problems. 1-4 Credits.
Students work under the supervision of a member of the staff. A written report is required. Repeatable for credit. Prerequisites: Open by permission to graduate students and qualified seniors. Repeatable.

EE 595. Design Project. 3-6 Credits.
A three to six credit course of engineering design experience involving individual effort and a formal written report. Repeatable to 6 credits. Prerequisites: Restricted to Master of Engineering student candidates and subject to approval by the student's advisor. Repeatable to 6 credits.

EE 599. Doctoral Research in Electrical Engineering. 1-15 Credits.
Doctoral Research. Repeatable. F,S,SS.

EE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

EE 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

EE 999. Dissertation in Electrical Engineering. 1-18 Credits.
Dissertation for Ph.D. EE students. Repeatable to 18 credits. F,S,SS.

Undergraduate Courses for Graduate Credit

EE 411. Communications Engineering. 3 Credits.
Mathematical definition of random and deterministic signals and a study of various modulation systems. Prerequisite: EE 314. On demand.

EE 423. Power Systems I. 3 Credits.
Electric power systems operation, control and economic analysis. Prerequisite: EE 313. On demand.

EE 428. Robotics Fundamentals. 3 Credits.
Fundamentals of robotic systems: modeling, analysis, design, planning, and control. The project provides hands-on experience with robotic systems. Prerequisite: MATH 266 or consent of instructor. On demand.

EE 430. Introduction to Antenna Engineering. 3 Credits.
Review of vector analysis and Maxwell's equations, wave propagation in unbounded regions, reflection and refraction of waves, fundamental antenna concepts, wire-and aperture-type antennas, wave and antenna polarization, antenna measurements, and computer-aided analysis. Prerequisite: EE 409 or consent of instructor. On demand.

EE 434. Microwave Engineering. 3 Credits.
Review of transmission lines and plane waves, analysis of microwave networks and components using scattering matrices, analysis of periodic structures, transmission and cavity type filters, high frequency effects, microwave oscillators, amplifiers, and microwave measurement techniques. Prerequisite: EE 409 or consent of instructor. On demand.

EE 451. Computer Hardware Organization. 3 Credits.
The study of complete computer systems including digital hardware interconnection and organization and various operation and control methods necessary for realizing digital computers and analog systems. Prerequisite: EE 201 and EE 304; or consent of instructor. On demand.

EE 456. Digital Image Processing. 3 Credits.
Digital image retrieval, modification, enhancement, restoration, and storage. Image transformation and computer vision. The associated laboratory provides hands-on experiences. Prerequisite: EE 304 and EE 314. On demand.

Energy Systems Engineering

http://engineering.und.edu/chemical/graduate-program/index.cfm

Faculty: Alshami, Ames, Bowman, Cavalli, Gosnold, Grewal, Ji, Kolodka, Krishnamoorthy (Graduate Program Director), Mann, Pukkonen, Salehtar, Seames, Tande, Wills and Zahui

Degrees Granted: Master of Science (M.S.), Master of Engineering (M.Engr.) and Doctor of Philosophy (Ph.D.)

Responding to climate change, rising energy costs, and security issues facing society, the College of Engineering and Mines offers a Master of Science, a Master of Engineering and a Doctor of Philosophy degree in Sustainable Energy Engineering. These degree programs continue UND’s tradition as a world leader in energy-related research and education. The Sustainable Energy Engineering program educates graduate students in the growing field of sustainable energy engineering which includes the absorption and conversion of wind energy; geothermal energy conversion; renewable fuels and chemicals; hydrogen production, storage, distribution, and utilization; energy efficiency; the environmentally acceptable use of coal; the absorption and conversion of solar energy and other technologies. Coursework is designed to help students develop a broad background in the technical, economic, and societal factors needed to develop sustainable energy. Research projects provide focused, experiential learning in areas of sustainable energy engineering. Projects are often conducted through our interdisciplinary Sustainable Energy Research, Infrastructure and Supporting Education (ND SUNRISE) research initiative, the Petroleum Research, Education and Entrepreneurship Center of Excellence (PREEC) or in collaboration with the Energy and Environmental Research Center.

This program is designed to equip students for careers associated with sustainable energy technologies as well as to conduct research and development activities or to pursue advanced studies associated with technologies that will provide sustainable sources of energy in the future. Coursework will be designed to help students develop a broad background in the technical, economic, and societal factors needed to develop sustainable energy. Graduates from this program are expected to find employment in the emerging renewable energy economic sector as well as in the coal-fired utilities industry and supporting engineering companies. The M.S. degree is the most common option in the Sustainable Energy Engineering program and financial aid is provided to the vast majority of students working towards this degree.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section.

Master of Science (M.S.)

Mission Statement and Program Goals

The objective of the Sustainable Energy Engineering Master of Science program is to equip students for careers conducting research and development activities in sustainable energy fields, or pursuing advanced studies in technologies that will provide sustainable sources of energy in the future. This preparation will be customized to meet specific areas of interest to the students and for which the faculty is qualified to manage and instruct.

Goal 1: Graduates will have mastered selected topics in Sustainable Energy Engineering and related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient researchers, having the skills required to formulate, assess, and document a hypothesis.

Goal 3: Graduates will be well prepared for a career in industry, government, or doctoral studies in sustainable energy engineering.

Master of Engineering (M.Eng.)

Mission Statement and Program Goals

The objective of the Sustainable Energy Engineering Master of Engineering program is to equip students for careers designing and implementing sustainable energy technologies or pursuing advanced studies in technologies

University of North Dakota 495
that will provide sustainable sources of energy in the future. This preparation will be customized to meet specific areas of interest to the student with an emphasis on sustainable energy engineering design.

**Goal 1:** Graduates will have mastered selected topics in Sustainable Energy Engineering and related areas to achieve their specific goals and objectives.

**Goal 2:** Graduates will be proficient at engineering design, with the ability to solve complex sustainable energy engineering problems.

**Goal 3:** Graduates will be well prepared for a career in industry or government in sustainable energy engineering.

### Doctor of Philosophy (Ph.D.)

**Mission Statement and Program Goals**

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Sustainable Energy Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings.

**Goal 1:** Graduates will have a depth of knowledge in civil engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

**Goal 3:** Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in civil engineering or a related field.

### Master of Science (M.S.)

**Admission Requirements**

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in chemical, mechanical, environmental engineering or related field. Students holding a B.S. degree in a science or an unrelated engineering field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. An overall undergraduate GPA of at least 2.75, or 3.00 for the last two years. (An overall GPA of at least 3.3 for the combined BS CHE / MS ESE or combined BS ME / MS ESE degree is required.)
3. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

**Thesis Option**

1. A minimum of 30 semester credits, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of nine semester credits may be transferred from another institution.
4. **Required Courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHE 591</td>
<td>Research</td>
<td>3</td>
</tr>
<tr>
<td>CHE 997</td>
<td>Development</td>
<td>2</td>
</tr>
<tr>
<td>CHE 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
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</tbody>
</table>

5. A thesis documenting research on a topic related to energy systems engineering.

### Non-Thesis Option

1. A minimum of 32 semester credits, including credits granted for the independent study project.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of nine semester credits may be transferred from another institution.
4. **Required Courses:**

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHE 591</td>
<td>Research</td>
<td>4</td>
</tr>
<tr>
<td>CHE 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

5. Preparation of a written independent study report approved by the faculty advisor.
6. Passing of a comprehensive final examination.

### Master of Engineering (M.Eng.)

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in chemical, mechanical, environmental engineering or related field. Students holding a B.S. degree in a science or an unrelated engineering field may be admitted to Qualified Status with an obligation to acquire a background in chemical or mechanical engineering. The exact requirements will be determined on a case-by-case basis.
2. An overall undergraduate GPA of at least 2.50, or 3.00 for the last two years.
3. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

1. A minimum of 30 semester credits, including the credits granted for the design project.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of nine semester credits may be transferred from another institution.
4. **Required Courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 595</td>
<td>Design Project</td>
<td>6</td>
</tr>
<tr>
<td>CHE 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

5. A written report documenting work on a successfully completed energy systems engineering design project.
6. Passing of a comprehensive final examination.
Students admitted to the Energy Systems Engineering program are expected to take the majority of their courses from the following course offerings. The student’s exact program of study is decided on a case by case basis by the student in consultation with their faculty advisor and with approvals by the Director of the ESE graduate program and the Dean of the School of Graduate Studies. Other recommended courses will be published on the College of Engineering's website.

CHE 503 Fuels Technology 3
CHE 504 Air Pollution Control 3
CHE 515 Design of Engineering Experiments 3
CHE 520 Impurities in Combustion and Gasification Systems 3
CHE 535 Metallic Corrosion and Polymer Degradation 3
EE 423 Power Systems I 3
EE 522 Renewable Energy Systems 3
EE 523 Power Systems II 3
ENGR 501 Energy, Resources and Policy 3
ENGR 502 Alternative Energy Systems 3
ME 464 Computational Fluid Dynamics 3
ME 545 Fluidized-Bed Combustion Engineering 3
CHE 562 Seminar in Chemical Engineering 1
CHE 591 Research 1-15
CHE 595 Design Project 3-6
CHE 997 Independent Study 2
CHE 998 Thesis 1-9

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog. Additional requirements include:

1. B.S. degree in an engineering discipline from an ABET accredited program with a GPA of at least 3.0 or a M.S. degree in an engineering discipline with a GPA of at least 3.0. Students holding a B.S. degree in a science or other engineering-related field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.

2. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.

3. Satisfy the School of Graduate Studies' English Language Proficiency Requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School. The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. A minimum of 90 semester credits, including acceptable master's degree work and credits granted for the dissertation and the research leading to the dissertation. These 90 credits should include:
   • 30 to 48 semester credits of coursework taken from the approved list published by the Energy Engineering program. Other courses may be accepted with approval of the student's faculty advisor and the graduate director.
   • 30 to 48 semester credits of research.
   • 12 credits of dissertation.

2. Successful completion of an oral comprehensive exam when at least 45 post baccalaureate credits have been completed. This exam will be based on core courses taken for this degree and their application to the student's research. The exam will be administered by at least three graduate faculty members from the Institute for Energy Studies and its Faculty Affiliates. Candidates who fail the exam will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial exam attempt.

3. Students must present to their advisory committee an annual oral progress report describing research progress.

4. Preparation and defense of a dissertation documenting original and independent research on a topic related to energy engineering.

5. Scholarly Tools: Engineering and mathematics courses required to fulfill the requirements for those students admitted under Qualified Status. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 1.

6. There is no residency requirement for this program.

Courses

SEE 510. Process Design & Feasibility Assessment of Sustainable Technologies, 3 Credits.
The research-to-commercialization life cycle and evaluation methods are examined in depth using sustainable energy technologies as specific case studies.

SEE 590. Special Topics in Sustainable Energy Engineering, 1-6 Credits.
Investigations of special topics in sustainable energy engineering dictated by students and faculty interests. Repeatable. Prerequisite: Consent of instructor. Repeatable.

Environmental Engineering

http://engineering.und.edu/chemical/graduate-program/index.cfm

Faculty: Alshami, Bowman, Gerla, Gullicks, Krishnamoorthy (Graduate Program Director), Mann, Moretti, Seames and Wills

Degrees Granted: Master of Science (M.S.), Master of Engineering (M.Engr.) and Doctor of Philosophy (Ph.D.)

The Environmental Engineering graduate program combines those aspects of Chemical, Civil, and Geological Engineering most applicable to environmentally related problems. This program is, to our best knowledge, unique in the combination of these three disciplines for the training of graduate students in environmental engineering. These interdisciplinary M.S., M.Engr., Ph.D., and Certificate programs provide high-quality education and skill development opportunities, preparing students to be professionally successful, to be life-long learners, and to be knowledgeable, contributing members of a multicultural, global society. The faculty of the three participating departments and participating UND Energy and Environmental Research Center (EERC) personnel represent a tremendous wealth of environmental expertise based on past and current field and laboratory research, consulting experience, professional organization involvement, and formal continuing education and technical training. They also have strong working relationships with personnel from a wide variety of industries, municipalities, consulting firms, governmental agencies, and research-funding organizations. These relationships will provide many opportunities for collaboration and research, which will be beneficial to all stakeholders of the programs.

The program is oriented primarily towards a Master of Science (M.S.) degree. A research project, culminating in a master's thesis is a major part of this program. The program emphasizes a multidisciplinary approach to Environmental Engineering from Chemical, Civil, and Geological perspectives and includes the three major environmental areas relating to the mitigation of environmental impacts from gaseous, liquid, and solid-phase emission sources. Students benefit from the interactions between the proposed programs and the EERC. The EPA-certified laboratories, pilot processes, research specialists, and ongoing research opportunities at the EERC are phenomenal assets.

In addition, a number of on-campus laboratory facilities, including the multidisciplinary Environmental Analytical Research Laboratory (Leonard Hall), Civil Engineering Environmental and Hydraulics Laboratories, and Chemical Engineering Laboratories are well equipped and fully available to the proposed programs. Enhanced research opportunities and additional analytical laboratory expertise will be available through established off-campus relationships with numerous state agencies, industries, consulting firms and communities.
Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section.

**Master of Science (M.S.)**

**Mission Statement and Program Goals**

The mission of the Environmental Engineering Master of Science program is to prepare environmental engineers and environmental engineering scientists for careers in

1. industry or government, and/or
2. doctoral studies in environmental engineering or related fields.

This preparation will include advanced coursework in the three core disciplines supporting the field of environmental engineering, namely chemical, civil, and geological engineering, plus additional study and research in specific areas of interest to the student and for which the faculty is qualified to direct and instruct.

**Goal 1:** Students, with the advice of their research advisor and thesis committee, will construct a program of study that meets their individual learning goals and objectives, while fulfilling the qualifications for the M.S. Environmental Engineering degree.

**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess, and document a hypothesis.

**Goal 3:** Graduates will be well prepared for a career in industry and/or doctoral studies in environmental engineering or a related field.

**Master of Engineering (M.Engr.)**

**Mission Statement and Program Goals**

The mission of the Environmental Engineering Masters of Engineering program is to prepare environmental engineers for careers in industry or government. This preparation will include advanced coursework in the three core disciplines supporting the field of environmental engineering, namely chemical, civil, and geological engineering, with an emphasis on engineering design, plus work on an environmental engineering design project in specific areas of interest to the student and for which the faculty is qualified to direct and instruct.

**Goal 1:** Students, with the advice of their advisor will construct a program of study that meets their individual learning goals and objectives, while fulfilling the qualifications for the M.Engr. Environmental Engineering degree.

**Goal 2:** Graduates will be proficient at engineering design, with the ability to solve complex environmental engineering problems.

**Goal 3:** Graduates will be well prepared for a career in industry or government in environmental engineering or a related field.

**Doctor of Philosophy (Ph.D.)**

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Environmental Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings

**Mission Statement and Program Goals**

**Goal 1:** Graduates will have a depth of knowledge in environmental engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

**Goal 3:** Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in environmental engineering or a related field.

**Master of Science (M.S.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree from an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering. Students holding a B.S. degree in other engineering disciplines or in a science field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. An overall undergraduate GPA of at least 2.75, or 3.00 for the last two years.
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the Environmental Engineering Program.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of eight semester credits may be transferred from another institution.
4. Required Courses:
   - ENVE 562 Seminar in Environmental Engineering (1 credit per semester) 2
   - ENVE 591 Environmental Engineering Research 3
   - Select a minimum of 3 credits from the following: 3
     - CHE 501 Advanced Transport Phenomena
     - CHE 504 Air Pollution Control
     - CHE 512 Transport Of Mass
   - Select a minimum of 3 credits from the following: 3
     - CE 531 Environmental Engineering III
     - CE 532 Environmental Engineering IV
     - CE 535 Hazardous Waste Management
   - Select a minimum of 3 credits from the following: 3
     - GEOE 417 Hydrogeology
     - GEOL 540 Water Sampling and Analysis
     - ENVE 998 Thesis
   - Electives 12

Total Credits 26

5. A thesis documenting research conducted on a problem(s) related to Environmental Engineering is required.
Master of Engineering (M.Engr.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree from an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering. Students holding a B.S. degree in other engineering disciplines or in a science field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. An overall undergraduate GPA of at least 2.50, or 3.00 for the last two years.
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Engineering degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the Environmental Engineering Program.

1. A minimum of 30 semester credits in a major field, including the credits granted for the engineering design project.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of eight semester credits may be transferred from another institution.
4. Required Courses:
   - ENVE 562 Seminar in Environmental Engineering 1
   - ENVE 595 Design Project 3-6
   - Select a minimum of 3 credits from the following: 3
     - CHE 501 Advanced Transport Phenomena
     - CHE 504 Air Pollution Control
     - CHE 512 Transport Of Mass
   - Select a minimum of 3 credits from the following: 3
     - CE 531 Environmental Engineering III
     - CE 532 Environmental Engineering IV
     - CE 535 Hazardous Waste Management
   - Select a minimum of 3 credits from the following: 3
     - GEOE 417 Hydrogeology
     - GEOL 540 Water Sampling and Analysis
   - Electives 14-17
   - Total Credits 27-33
5. A written report documenting work on a successfully completed environmental engineering design project.

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Additional requirements include:

1. B.S. degree in an engineering discipline from an ABET accredited program with a GPA of at least 3.0 or a M.S. degree in an engineering discipline with a GPA of at least 3.0. Students holding a B.S. degree in a science or other engineering-related field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School. The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. A minimum of 90 semester credits, including acceptable master’s degree work and credits granted for the dissertation and the research leading to the dissertation. These 90 credits should include:
   - 30 to 48 semester credits of coursework taken from the approved list published by the Environmental Engineering program.
   - Other courses may be accepted with approval of the student’s faculty advisor and the graduate director.
   - 30 to 48 semester credits of research.
   - 12 credits of dissertation.
2. Successful completion of an oral comprehensive exam when at least 45 post baccalaureate credits have been completed. This exam will be based on core courses taken for this degree and their application to the student’s research. The exam will be administered by at least three graduate faculty members from the Institute for Environmental Studies and its Faculty Affiliates. Candidates who fail the exam will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial exam attempt.
3. Students must present to their advisory committee an annual oral progress report describing research progress.
4. Preparation and defense of a dissertation documenting original and independent research on a topic related to environmental engineering.
5. Scholarly Tools: Engineering and mathematics courses required to fulfill the requirements for those students admitted under Qualified Status. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 1.
6. There is no residency requirement for this program.

Environmental Engineering Certificate Program

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering.
2. Students holding a B.S. degree in other engineering disciplines or in a science field with an appropriate background in chemistry, fluid mechanics, and mathematics may also be admitted.
3. An overall undergraduate GPA of at least 2.50 or 3.00 for the last two years.

Courses shall only count as credit toward fulfilling the requirements listed above when a grade of C or greater has been awarded at the completion of the course.

Certificate Requirements

1. A total of nine (9) credit hours must be completed in Graduate level courses listed as Environmental Engineering, Chemical Engineering, Civil Engineering, Geology, or Geological Engineering, and identified as qualified courses for the certificate.
2. A minimum GPA of 3.00 is required to earn the certificate.
Program graduates shall have the ability to independently conduct research, solving complex problems related to petroleum and geothermal energy, mineral production, and environmental concerns, and natural hazards.

Goal 1: Program graduates shall have sufficient skills in geoscience, mathematics, computer modeling, and porous-mechanics to formulate and solve practical problems in geological engineering.

Goal 2: Program graduates shall have the ability to independently conduct research to advance the state of the knowledge; and/or to provide innovative solutions to technical problems in a timely manner in at least one of the areas of exploration and production of energy and mineral resources, geomechanics, hydrogeology, ground water remediation, or site investigation/characterization.

Goal 3: Program graduates shall be skilled in research methods, be able to access, critically analyze, and utilize available information from a variety of sources; and shall be able to communicate the results of a research or development project both orally and in writing.

Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Geological Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings

Goal 1: Graduates will have a depth of knowledge in geological engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

Goal 3: Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in engineering or a related field.
3. Maintained an overall GPA of at least 3.0 in all geological sciences they took.
4. Completed an application to the UND Graduate School and been accepted for admission.

Once admitted to the Combined Degree Program, undergraduate students are eligible to take 500-level courses for graduate credit. Students must complete the petition titled, "Graduate Credit as an Undergraduate Student" prior to registering for the courses. Such courses could be included in the 30 credit hours for the degree and could appear in the program of study.

Students in the Combined Degree Program will be admitted to the School of Graduate Studies on completion of 125 credit hours for the bachelor's degree.

The time normally needed to complete the Combined Degree Program is 1 year, plus an additional summer after admission to the Graduate School.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies' as well as particular requirements set forth by the Harold Hamm School of Geology and Geological Engineering.

Thesis Option:

1. A minimum of 30 credit hours in a major field, including the credits granted for the thesis and the research leading to the thesis.

   Geology/Geological Engineering coursework 12
   Other Engineering and Science coursework 12
   Thesis 6
   Total Credits 30

2. At least one-half of the credit hours must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the thesis.

Non-Thesis Option (Independent Study):

1. Thirty-four (34) credit hours including credits required for the major.

   Geology/Geological Engineering coursework 15
   Research Project/Independent Study 3
   Electives 16
   Total Credits 34

2. At least one-half of the credit hours must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Preparation of a written independent study approved by the faculty advisor.
5. Comprehensive final examination.

Doctor of Philosophy (Ph.D.)

Admission Requirements

1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or higher or a Master of Science degree in an engineering discipline with a GPA of 3.0.
2. Satisfy the Graduate School's English Language Proficiency requirements as published in the Graduate Catalog.
3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers Student's Record of Publications, GRE test scores (for students who are applying with a B.S. engineering degree from an non-ABET accredited program), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.
4. A student holding a non-engineering degree or who does not meet the minimum requirements in items 1-2 above may apply to one of the Master of Science degree programs in the College of Engineering and Mines. Students successfully completing a UND M.S. engineering degree will be considered to satisfy the requirements of items 1-2 above; however, these students shall still be subject to the holistic evaluation process described in item 3 with the exception that new GRE test scores will not be required.
5. Students admitted to an engineering M.S.E.E. program but meeting the minimum requirements in items 1-2 above, may after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the master’s degree and work directly toward the Ph.D. degree. The recommendation of the advisory committee shall be brought to a vote by the program graduate committee relevant to the degree track requested by the student. A minimum of one week before such a meeting, the program graduate committee shall be notified and provided with the student’s updated file which shall consist of the materials used for application into the M.S.E.E. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered. If the recommendation is approved by the relevant graduate committee, the student will be given the qualifying exam. Passing this exam will advance the student to Approved Status in the Doctoral Program in Geological Engineering.

Residence Requirements

The purpose of residence requirements is to provide an opportunity for a sustained and concentrated intellectual effort, to provide for immersion in an academic research environment, and to permit extensive interaction with fellow students and faculty of the Geological Engineering Department. Within the first two years of graduate work at UND, at least two consecutive semesters must be completed in residence. During residency, a student must be registered for at least nine credits in a semester, or be a graduate research or teaching assistant taking the appropriate credits to qualify as a full-time student. The remainder of the credits required for a degree can be completed in a manner to accommodate the student’s fiscal, family, job related, and other constraints with the consent of the student’s adviser. The program of study must be completed within the seven-year period normally allowed for graduate programs.

Under special circumstances, the student in conjunction with his/her advisory committee and the Geological Engineering Graduate Committee, can petition the Dean of the Graduate School for variances in this policy.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geological Engineering Doctoral Program.

The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the GEOE 493-selected topics in geological engineering.
7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this graduate catalog). The coursework shall include a minimum of 27 credit hours of Geological Engineering (or relevance courses with the consent of advisor) coursework selected from the approved list of courses. Equivalent graduate level coursework may be transferred from a master’s program.
8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. The qualifying examination includes the following three sections.
Section I

It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II

A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:
1. a literature review of the relevant field of research related to the project
2. proposed methods
3. preliminary results (simulation or experiment)
4. the objectives of the proposed project, and
5. tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written exam, student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade a date can be scheduled for an oral presentation (i.e., Section III). If failed, student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III

An oral comprehensive examination should be presented to the committee on the research topics described in the above section (II-a to II-e). Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than 6 months as specified by the student committee. Student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

1. After successful completion of the written research proposal and oral presentation, an annual oral progress report should be presented to the committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.

2. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a written dissertation covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed research journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists of the PhD committee and an external examiner from outside the University. The external examiner is selected by the department’s graduate committee from a list of three candidates proposed by the advisor. The external examiner should not have any common publication with the student’s advisor or student and can be from academia or industry with a expertise relevant to the student’s research. The student and advisor should not contact the external examiner directly before or after.

3. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.courseleaf.com/graduatestudies)). Four results of the examination can be obtained: 1) pass; 2) minor revision 3) major revision and 4) fail. For minor revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a PhD degree and may request to be reclassified as a master’s student and complete a Master of Science degree.

4. At least two peer reviewed ISI (Institute for Scientific Information) journals (as the first author) and two peer reviewed conference papers (as the first author) submitted with the consent of advisor.

GEOE Courses

GEOE 555. Advanced Rock Mechanics. 3 Credits.
Fundamentals of rock mechanics, elasticity theory of rock, failure criterion of rocks, laboratory and field testing methods, field instrumentation, the applications of rock mechanics in mining, tunneling and rock slopes, engineering, and the applications of numerical methods in rock mechanics.
Prerequisites: GEOE 323 and ENGR 203. F.

GEOE 591. Advanced Hydrocarbon Extraction in Engineering. 3 Credits.
This course describes technologies that can be applied to further recover underground energy resource - oil/gas, for example, that cannot be produced by primary or second extraction. Development of these processes requires significant technological advances in our understanding of underground mining from hydrocarbon reservoirs and may be the stimulus for future technological development.
Prerequisites: GEOE 301, MATH 166, MATH 266, CHEM 122, and CHEM 122. F.

GEOE 599. Doctoral Research. 1-15 Credits.
Research contributing to the discovery and dissemination of knowledge and/or technology in Geological Engineering and contributing to the student's doctoral dissertation. Prerequisite: Admission to the PhD program in Geological Engineering. Repeatable to 15 credits. F.S,SS.

GEOE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOE 998. Thesis. 1-9 Credits.

GEOE 999. Dissertation. 1-18 Credits.
PhD student doctoral dissertation. Prerequisite: Admission to the PhD program in Geological Engineering. Repeatable to 18 credits. S/U grading. F.S,SS.

Undergraduate Courses for Graduate Credit

GEOE 323. Engineering Geology. 3 Credits.
This course is to introduce the application of geological, hydrological and environmental principles to geotechnical/geological engineering design, construction and operation as well as various geohazards. Prerequisites: One introductory geology course and MATH 165.

S.

GEOE 417. Hydrogeology. 3 Credits.
Physical and chemical aspects of groundwater movement, supply, and contamination. Prerequisites: CHEM 121 or CHEM 221; MATH 168 or consent of instructor.

F.

GEOE 418. Hydrogeological Methods. 2 Credits.
Field and laboratory methods used in hydrogeology; techniques of drilling, well and piezometer installation, determination of aquifer parameters, geophysical exploration, soil classification and analysis, ground water sampling and analysis. Includes field trip. Prerequisite: GEOE 417.

F.

GEOE 419. Groundwater Monitoring and Remediation. 3 Credits.
Statistical methods for groundwater sampling and monitoring network design. Groundwater remediation and design; including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treatment. Prerequisites: MATH 166, GEOE 417 and a statistics course (ECON 210, PSyc 241, MATH 321 or MATH 353) or consent of instructor.

S.

GEOE 425. Design Hydrology for Wetlands. 3 Credits.
Principles of chemistry, geology, hydraulics, and hydrology applied to natural and constructed wetlands and other small catchments. Prerequisites: CHEM 121 and either CE 306/ME 306 or GEOE 417.

S.
GEOE 427. Groundwater Modeling. 3 Credits.
Fundamentals of numerical modeling applied to groundwater flow. Spreadsheet calculations will be used to demonstrate the finite difference method applied to groundwater movement and storage. Simulation of practical groundwater problems will be performed with the U.S. Geological Survey's MODFLOW code. Prerequisites: GEOE 417 and MATH 265; some programming experience is recommended. On demand.

GEOE 455. Geomechanics II. 2 Credits.
The objective of this course is to train the students to use fundamental principles and field and lab techniques of Rock Mechanics to analyze real-world problems, identify the optimal methods, and solve the practical geological engineering problems with the combination of field and laboratory, analytical and experimental means. Emphases will be on the fundamental principles and their application to practical engineering problems, both surface and underground. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 355. F.

GEOE 493. Selected Topics in Geological Engineering. 1-3 Credits.
Detailed study of selected topics in Geological Engineering. Includes laboratory if applicable. Repeatable. On demand.

GEOL Courses

GEOL 500. Sedimentary Geology. 1-4 Credits.
Selected topics in sedimentary geology, such as sedimentary processes, carbonate petrology, clastic petrology, and basin analysis. May be repeated up to 12 credits. Prerequisite: Consent of instructor. Repeatable to 12 credits. F.

GEOL 505. Isotope Geochemistry. 3 Credits.
Geochemistry and cosmochemistry of radioactive and stable isotopes; isotope equilibria; applications in paleoclimatology, environmental isotope geochemistry, igneous, metamorphic, and sedimentary petrology. Prerequisite: GEOL 321 or permission of instructor.

GEOL 506. Glacial Geology. 4 Credits.
Origin, growth, and movement of glaciers; landforms and deposits incident to glaciation; 3 hours lecture, 2 hours laboratory time per week. Prerequisite: GEOL 311.

GEOL 509. Advanced Mineralogy. 1-4 Credits.
Advanced study of specific mineral groups or selected topics in mineralogy. Prerequisite: GEOL 320; recommended prerequisite GEOL 321.

GEOL 511. Advanced Structural Geology. 4 Credits.
Reading and research in special topics in structural geology and geotectonics.

GEOL 512. Advanced Petrology. 1-4 Credits.
Selected topics in petrology taught using conventional lecture and laboratory/field approach. Prerequisite: GEOL 320.

GEOL 515. Advanced Paleontology. 3 Credits.
Selected topics include (but not limited to): Invertebrate paleontology; vertebrate paleontology; paleoecology; taxonomy; museum studies; western continental stratigraphy; critical boundaries. May be repeated. Prerequisites: GEOL 415, BIOL 150, or consent of instructor. Repeatable to 40 credits. On demand.

GEOL 518. Topics in Advanced Stratigraphy. 2-4 Credits.
Selected topics in lithostratigraphy and biostratigraphy. Prerequisites: GEOL 411, GEOL 415. Repeatable to 4 credits.

GEOL 520. Statistical Applications in Geology. 3 Credits.
The application of statistical techniques to geologic data and problems, with emphasis on analysis of geologic sequences, map analysis, and multivariate analysis of geologic data. Prerequisites: An introductory statistics course, such as CTL 515 or PSYC 241, and consent of instructor.

GEOL 522. History and Philosophy of Geology. 3 Credits.
Historical and philosophical development of the science of geology. Prerequisite: Permission of instructor.

GEOL 523. Topics in Advanced Geomorphology. 1-4 Credits.
Selected topics in geomorphic processes and landforms. Prerequisite: GEOL 311. Repeatable to 4 credits.

GEOL 525. Weathering and Soils. 3 Credits.
Properties and classification of soils; the factors and processes of weathering and soil formation. Prerequisite: GEOL 311 and GEOL 411, or consent of instructor.

GEOL 530. Topics in Physical Hydrogeology. 2 Credits.
Selected topics in groundwater, vadose-zone hydrology, fracture flow, analytical/numerical modeling, GIS and hydrology, and wetland soils/hydrology. Repeatable when topics vary. Prerequisite: Consent of instructor. Repeatable to 8 credits. F,S.

GEOL 531. Hydrogeochemistry. 3 Credits.
The origin, characteristics and modeling of surface and ground water geochemistry. Prerequisites: GEOL 321 and, MATH 166, or permission of instructor.

GEOL 532. Contaminant Hydrogeology. 3 Credits.
Chemical and physical processes affecting contaminant behavior in groundwater with analytical/numerical modeling and case studies. Prerequisites: GEOL 417 and GEOL 427 and MATH 265, or consent of instructor.

GEOL 540. Water Sampling and Analysis. 3 Credits.
Techniques of water and sediment sampling and analysis using equipment in the UND Water Quality Laboratory. Results are interpreted in the context of the natural systems from which the samples are taken. Enrollment is limited to eight students per section. A laboratory fee is required. Prerequisite: CHEM 121.

GEOL 551. Heat Flow. 3 Credits.
An exploration of Earth's thermal structure, thermal history and heat sources. The course begins with the theory of heat transfer within and through the surface of terrestrial planets. Methods of observation and modeling provide hands-on experience in field and laboratory activities. Applications of heat flow in tectonics, petrology, thermal maturity of kerogen, hydrogeology, geothermics and climate change are presented with current examples. Prerequisite: Graduate standing. Corequisite: Permission of instructor. On demand.

GEOL 560. Geothermics I. 3 Credits.
A survey of the methods of geothermal exploration, assessment and production. The course covers the various methods for discovery and characterization of geothermal resources. Methods for assessment of energy in place and determination of recoverable energy are covered in depth. Current technologies for energy extraction and power production are presented with current examples. Prerequisite: Graduate standing. Corequisite: Permission of Instructor. On demand.

GEOL 561. Geothermics II. 3 Credits.
The course covers the historical development of geothermal policies, regulations and practices globally and in different states within the US. Matters of water usage, contamination and disposal are covered extensively. Current issues such as induced seismicity, hydrofracture, power plant size and location, electrical grid access and land use are critically examined. Prerequisite: Graduate or Senior Standing. Corequisite: Permission of Instructor. On demand.

GEOL 590. Research. 1-4 Credits.
Laboratory, field, or library research on problems of interest (may be repeated). Repeatable.

GEOL 591. Directed Studies. 1-4 Credits.
Directed advanced research in a specialized field of geologic study (may be repeated). Repeatable.

GEOL 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOL 997. Independent Study. 2 Credits.

GEOL 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

GEOL 999. Dissertation. 2-12 Credits.
May be repeated up to 24 credits. Repeatable to 24 credits.

Undergraduate Courses for Graduate Credit

GEOL 311. Geomorphology. 4 Credits.
Dynamics of weathering, mass movement, running water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. Prerequisites: GEOL 101 or GEOE 203; MATH 165, PHYS 211, CHEM 121 or consent of instructor. F.

GEOL 320. Petrology. 3 Credits.
Description, classification and origin of igneous, metamorphic, and sedimentary rocks. Field and laboratory study of rocks. Engineering properties of earth materials. Advanced aspects of optical mineralogy. Includes laboratory. Prerequisite: GEOE 318. F.
GEOL 321. Geochemistry. 3 Credits.
Application of the principles of chemistry to geologic and hydrogeologic problems. Origin and distribution of the chemical elements. Introduction to radiochemistry, isotopic geochronology, and stable-isotope geochemistry. Prerequisites: GEOL 318, CHEM 122, and MATH 165 or consent of instructor. S.

GEOL 340. Digital Mapping Methods. 3 Credits.
This course integrates "hands-on" data acquisitions and map generation with an overview of the technology (GPS, lasers, and data management). Field projects focus on mapping methodology and laboratory projects focus on analysis and presentation. It is assumed that students have an undergraduate geology background and a basic knowledge of computer applications. Prerequisite: Junior Standing in geology.

GEOL 407. Petroleum Geology. 3 Credits.
Origin, accumulation and geologic occurrence of petroleum and gas. Prerequisites: GEOL 101 or GEOE 203, and GEOL 102. F, odd years.

GEOL 411. Sedimentology and Stratigraphy. 5 Credits.
Origin, transportation, deposition, and diagenesis of sediments; principles and applications of stratigraphy. Includes field trip and laboratory. Prerequisite: GEOL 320. S.

GEOL 414. Applied Geophysics. 3 Credits.
Principles of various geophysical methods and their application to geologic problems. Prerequisites: GEOL 101 or GEOE 203; MATH 165; and PHYS 211 or 251. F.

GEOL 415. Introduction to Paleontology. 4 Credits.
The principles of paleontology/paleobiology are presented using fossils to document the evolutionary, stratigraphic, and paleoecologic history of animal and plant life on Earth. Includes field trip and laboratory. Prerequisites: GEOL 102; BIOL 150 and BIOL 151 are recommended prerequisites. F, even years.

GEOL 422. Seminar II. 1 Credit.
Continuation of GEOL 421 experience. Preparation and delivery of oral presentations in science and engineering, culminating in oral presentation of senior thesis (Geol 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. Prerequisites: GEOL 421; senior or graduate status in departmental major. F.S.

Mechanical Engineering

http://www.me.und.edu

Faculty: Ames, Bandyopadhyay, Bibel, Cavalli, Grewal, Gupta, Neubert (Graduate Director), Semke, Tang, Yang and Zahui

Degrees Granted: Master of Science (M.S.), Master of Engineering (M.Engr.) and Doctor of Philosophy (Ph.D.)

The Department of Mechanical Engineering offers graduate programs leading to the Master of Science (M.S.), the Master of Engineering (M.Engr.) and the Doctor of Philosophy (Ph.D.) degrees. The M.S. degree is a research-oriented degree that is available in either thesis or non-thesis options. The non-thesis M.S. degree requires completion of an independent study. The M. Engr. degree is an engineering practice-oriented degree that requires completion of an engineering design project.

The Department offers combined B.S./Master's programs that allow a student to complete a master's degree in as little as one year beyond the bachelor's degree. The master's degree may be either an M.S. or M. Engr. See "Combined Degree Program (p. 618)" under the College of Engineering and Mines section for additional details.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section.

Master of Science (M.S.)

Mission Statement and Program Goals

Thesis Option
The mission of the Master of Science (Thesis) in Mechanical Engineering program is to prepare mechanical engineers for either technical careers in government or industry or for doctoral studies in mechanical engineering or related fields. This preparation will include guided, independent research and advanced coursework in mechanical engineering and related areas. Both the research and the coursework will be selected as appropriate in specific areas of interest to the student and their graduate committee and for which the faculty is qualified to direct and instruct.

Non-Thesis Option
The mission of the Master of Science (Non-Thesis) in Mechanical Engineering program is to prepare mechanical engineers for technical careers in government or industry in mechanical engineering or related fields. This preparation will include guided, independent research and advanced coursework in mechanical engineering and related areas. Both the research and the coursework will be selected as appropriate in specific areas of interest to the student and their graduate advisor and for which the faculty is qualified to direct and instruct.

Student Learning Goals

Thesis Option
Goal 1: Graduates will demonstrate a mastery of scientific research by formulating, assessing, and documenting a scientific hypothesis.

Goal 2: Graduates will be well prepared for a career in government/industry and/or doctoral studies in mechanical engineering or a related field.

Non-Thesis Option
Goal 1: Graduates will demonstrate a mastery of scientific investigation by researching and preparing a scholarly report on a topic related to mechanical engineering.

Goal 2: Graduates will be well prepared for a career in government/industry in mechanical engineering or a related field.

Master of Engineering (M.Engr.)

Mission Statement and Program Goals

The mission of the Master of Engineering in Mechanical Engineering program is to provide advanced preparation in the practice of mechanical engineering for mechanical engineers seeking technical careers in industry. This preparation will include a guided, independent design project and advanced coursework in mechanical engineering and related areas. Both the design project and the coursework will be selected as appropriate in specific areas of interest to the student and graduate advisor and for which the faculty is qualified to direct and instruct.

Goal 1: Graduates will demonstrate a mastery of the practical implementation of engineering concepts by identifying a substantial need, formulating a design or process to meet the need and implementing their solution to meet that need.

Goal 2: Graduates will be well prepared for a career in industry in mechanical engineering or a related field.

Combined Degree

To encourage undergraduate engineering students to extend their studies to include a graduate degree, the School of Engineering and Mines has a combined program that permits students to earn both a bachelor's and master's degree in an engineering discipline. This program allows students to designate two three-credit graduate courses to count for both degrees. The selected courses must have graduate course standing and be designated when a student requests admission to the program.
Students can complete additional courses for graduate-only credit prior to completion of the BSME if their schedule allows.

**Doctor of Philosophy (Ph.D.)**

**Program Description**
The Doctor of Philosophy (PhD) in Mechanical Engineering degree provides a student with specialized training customized to meet his or her specific interests and goals. Faculty advisors work with each student to structure a graduate program consisting of traditional mechanical engineering study, complementary multidisciplinary studies, strong interaction between fellow engineering students, and high quality research. Research topics are determined based upon the mutual interests of the student and research adviser. Students develop a strong research methodology and apply this research method to a specific engineering problem as directed by their adviser and doctoral committee. Attendance by the student is required at a weekly seminar. This seminar is used to enhance development of the research methodology by allowing students to present their research during various stages of development and to interact with peers at various stages of their degree program. The seminar also serves the important role of providing exposure of all students to a diverse range of multidisciplinary work.

**Program Goals**
The PhD in Mechanical Engineering provides students with a personalized education - fostering innovation and emphasizing technical, leadership, and entrepreneurship skills. It supports UND’s efforts to be internationally recognized for excellence in research - fostering discovery, serving societal needs, and stimulating technology transfer. Additionally, the program is intended to engage the community by promoting engineering and innovation, inspiring young minds, helping the regional economy thrive, and by fostering civic responsibility.

**Goal 1:** Graduates will have a depth of knowledge in mechanical engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.

**Goal 3:** Graduates will be well-prepared for advanced professional practice, for teaching, and for careers in research and creative activities in mechanical engineering or a related field.

**Master of Science (M.S.)**

**Admission Requirements**
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in Mechanical Engineering from an ABET accredited program and have an acceptable GPA.
2. GRE general test required for those applicants with undergraduate degrees from other than ABET accredited programs.
3. 2.75 overall undergraduate GPA or a GPA of at least 3.00 for the junior and senior years.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Completion of a research project and its presentation in a thesis (4-9 credits for ME 998 Thesis).

**Non-Thesis Option**

1. Thirty-two (32) credits including credits approved by the graduate advisor required for the major.
2. Two credits of ME 997 Independent Study.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.
6. Comprehensive final examination.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmental engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.

**Thesis Option**

1. A minimum of 30 semester credits in a major field approved by the graduate committee, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of a research project and its presentation in a thesis (4-9 credits for ME 998 Thesis).

**Master of Engineering (M.Engr.)**

**Admission Requirements**
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in Mechanical Engineering from an ABET accredited program and have an acceptable GPA
2. GRE general test required for those applicants with undergraduate degrees from other than ABET accredited programs.
3. 2.50 overall undergraduate GPA or a GPA of at least 2.75 for the junior and senior years of their undergraduate programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Students seeking admission to a combined B.S./Master’s program must have a GPA of at least 3.0 at the time of admission.

Students who hold an undergraduate engineering or science degree other than mechanical engineering may be admitted to provisional or qualified status with an obligation to acquire additional background in mechanical engineering as appropriate.

**Degree Requirements**

Students seeking the Master of Engineering degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Mechanical Engineering Department.

1. 30 credits approved by the graduate advisor
2. 15 credits at the 500 level or above
3. 9 credits of engineering science, basic science, and/or mathematics
4. ME 595 Design Projects for 9 credits
5. A written report on the design project.
6. All major department courses must be at the 400 level or above, and no courses below 300 level may be included in the program.
7. Comprehensive final examination.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmental engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.

**Degree Requirements**

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Mechanical Engineering Department.

1. B.S. degree in Mechanical Engineering from an ABET accredited program and have an acceptable GPA
2. GRE general test required for those applicants with undergraduate degrees from other than ABET accredited programs.
3. 2.50 overall undergraduate GPA or a GPA of at least 2.75 for the junior and senior years of their undergraduate programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Preparation of a written independent study approved by the faculty advisor.
6. Comprehensive final examination.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmental engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.

**Thesis Option**

1. A minimum of 30 semester credits in a major field approved by the graduate committee, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of a research project and its presentation in a thesis (4-9 credits for ME 998 Thesis).

**Non-Thesis Option**

1. Thirty-two (32) credits including credits approved by the graduate advisor required for the major.
2. Two credits of ME 997 Independent Study.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Preparation of a written independent study approved by the faculty advisor.
6. Comprehensive final examination.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmental engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.

**Master of Engineering (M.Engr.)**

**Admission Requirements**
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. B.S. degree in Mechanical Engineering from an ABET accredited program and have an acceptable GPA
2. GRE general test required for those applicants with undergraduate degrees from other than ABET accredited programs.
3. 2.50 overall undergraduate GPA or a GPA of at least 2.75 for the junior and senior years of their undergraduate programs.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Students seeking admission to a combined B.S./Master’s program must have a GPA of at least 3.0 at the time of admission.

Students who hold an undergraduate engineering or science degree other than mechanical engineering may be admitted to provisional or qualified status with an obligation to acquire additional background in mechanical engineering as appropriate.

**Degree Requirements**

Students seeking the Master of Engineering degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Mechanical Engineering Department.

1. 30 credits approved by the graduate advisor
2. 15 credits at the 500 level or above
3. 9 credits of engineering science, basic science, and/or mathematics
4. ME 595 Design Projects for 9 credits
5. A written report on the design project.
6. All major department courses must be at the 400 level or above, and no courses below 300 level may be included in the program.
7. Comprehensive final examination.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmental engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.
Doctor of Philosophy (Ph.D.)

Admission Requirements

1. A baccalaureate degree in an engineering or related discipline with a GPA of 3.5 or higher or a Master of Science degree in an engineering or related discipline.
2. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the Academic Catalog.
3. In addition to meeting the general provisions in the UND Academic Catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers the student’s Record of Publications, GRE test scores (for students who are applying with a B.S. engineering degree from an non-ABET accredited program), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students are strongly encouraged to contact individual faculty members in their area of research interest prior to applying.
4. Students admitted to an engineering M.S.M.E. program but meeting the minimum requirements in items 1-2 above, may, after one calendar year and upon the recommendation of his/her advisory committee, request to by-pass the master’s degree and work directly toward the Ph.D. degree. If the request is approved by the student’s advisory committee, the student will be given the qualifying exam. Passing this exam will advance the student to Approved Status in the Doctoral Program in Mechanical Engineering.

Financial Assistance

Financial aid in the form of teaching and research assistantships is available on a competitive basis. Students seeking financial aid should complete their Financial aid in the form of teaching and research assistantships is available on a competitive basis. Students seeking financial aid should complete their applications by February 15th for Fall or Summer admission and September 15th for Spring admission to be given full consideration. Assistantships are renewable for up to four years of support if progress toward the degree and instructional/research service are satisfactory, subject to the availability of funding. Students should contact faculty in their area(s) of research interest to inquire about funding availability for upcoming terms.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Mechanical Engineering Doctoral Program. The following requirements are in addition to the UND School of Graduate Studies general requirements for the Ph.D.:

1. 90 semester credits beyond the baccalaureate degree must be completed.
2. A 3.0 GPA must be maintained for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics must be demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the ME 562 or CHE 562–Graduate Seminar must be taken.
7. A minimum of 39 credit hours of non-research/dissertation coursework is required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this Academic Catalog). The coursework shall include a minimum of 27 credit hours of Mechanical Engineering (or relevant courses with the consent of the student’s advisor and advisory committee) coursework selected from the approved list of ME graduate level courses published in the UND Academic Catalog. Equivalent graduate level coursework may be transferred from a master’s program.
8. Four (4) written qualifying examinations must be successfully completed. They may be taken no later than the end of their second year of residence. One of the exam topics must be applied mathematics. The other examination topics must be selected from the following list:
   - Thermodynamics
   - Fluid Mechanics
   - Solid Mechanics
   - Robotics
   - Heat Transfer
   - Materials Science
   - Manufacturing
   - Dynamics
   - Controls
   - Vibrations

Topics for the examinations should be selected in consultation with the student’s advisor.

Qualifying examinations will be offered once per year during the fifth week of the spring semester. Students must notify the ME Graduate Director no later than the end of the second week of the spring semester of 1) their intention to take the exams, 2) their selected exam topics. No student will be required to complete more than two exams per day. Each exam will be two hours in length. No later than the 10th week of each fall semester, faculty that will be administering spring exams will determine what, if any, reference materials students will be allowed to use during their exam. A list of potential exam administrators will be available from the ME Graduate Director. Students should consult individual faculty as the allowable materials may vary from exam to exam.

Students will be awarded a grade of pass (score of 80% or higher on all exams), conditional pass (80% or higher on three exams), or fail. Students achieving a grade of conditional pass may be required to retake the exam on which they scored <80%, enroll in specific courses, or complete other remedial actions at the discretion of the examining faculty and the student’s advisory committee. Students failing (<80%) two or three exams will be required to retake all four exams. Examination retakes must occur during the next regular qualifying examination period. Students failing all four exams will be removed from the PhD program at the end of the semester in which the exams were taken. Students falling an exam area more than once will be removed from the PhD program at the end of the semester in which the exam was retaken.

A direct admit student who fails an exam a second time may request to be reclassified as a Master’s student at the discretion of the student’s advisor and the ME Graduate Director.

1. PhD students will complete a preliminary examination at least one year prior to their planned graduation date. The examination will consist of an oral presentation to their thesis committee of their progress to date and expected work to complete their degree. The committee will assess the presentation, progress and plan on a pass/fail basis. The preliminary examination must be passed prior to graduation. A student who fails the process more than once will be removed from the PhD program.
2. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research advisor and the advisory committee and will prepare a written dissertation covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists of the student’s advisory committee and an external examiner from outside the Department. The Department encourages the addition of a member from outside the University.
3. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.courseleaf.com/graduatestudies)). Four results of the examination can be obtained: 1) pass; 2) minor revision 3) major revision and 4) fail. For minor revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a PhD degree and may request to be reclassified as a master’s student and complete a Master of Science degree.
4. The candidate, with the consent of their advisor, must submit at least one peer reviewed journal article (as the first author), submit one conference paper (as the first author), and make one conference presentation.

Residence Requirements

The purpose of residence requirements is to provide an opportunity for a sustained and concentrated intellectual effort, to provide for immersion in an academic research environment, and to permit extensive interaction with fellow students and faculty of the Mechanical Engineering Department. Within the
Courses

ME 523. Advanced Machine Design. 3 Credits.
Advanced design and analysis of machine components; kinematic synthesis and analysis of mechanisms, force analysis, rotor dynamics, gyrodynamics, stresses in thick cylinders and flywheels, lubrication, statistical considerations, energy methods, curved beams. Prerequisites: ME 322 and ME 323.

ME 524. Deformation and Fracture. 3 Credits.
Aspects of elasticity theory, continuum mechanics and fracture mechanics. Fundamental relationships between material structure and engineering properties. Principles and properties of composite materials. Prerequisite: ME 301 or consent of instructor.

ME 525. Metal Fatigue in Engineering. 3 Credits.
Metal fatigue in engineering, involving design, development, and failure analysis of components, structures, machines, and vehicles subjected to repeated loading. Prerequisite: ENGR 203 and ME 301, or consent of instructor.

ME 526. Advanced Vibrations. 3 Credits.
Advanced vibration theory including the solutions of multi-degree of freedom coupled systems, continuous systems, energy methods, and non-linear vibrations. Prerequisite: ME 426.

ME 529. Advanced Finite Element Methods. 3 Credits.
Computer-aided techniques for finite element analysis of engineering systems. Topics include solution algorithm for nonlinear methods, large deflection, inelastic and contact analysis, and analysis of vibrating systems. Prerequisite: ME 429 or consent of instructor.

ME 532. Advanced Dynamics. 3 Credits.
Kinematics and kinetics of plane and three-dimensional motion, vector mechanics, general methods of linear and angular momentum, generalized coordinates, and variational methods including Hamilton's and Lagrange's equations. Prerequisites: ENGR 202 and MATH 266.

ME 542. Thermodynamics of Materials. 3 Credits.
Foundations of materials behavior in terms of energy and statistics. Topics will include entropy, free energy, phase equilibrium, ideal versus real solutions and diffusion. Prerequisites: ME 301 and ME 341, or consent of instructor.

ME 545. Fluidized-Bed Combustion Engineering. 3 Credits.
Fluidized-bed hydrodynamics and heat transfer. Design of fluidized-bed coal combustors. Combustion models and their significance. Prerequisite: ME 306 and ME 474, or consent of instructor.

ME 566. Introduction to Machine Vision. 3 Credits.
An introduction to machine vision providing students with a general understanding of the imaging process, feature extraction and matching, object detection and tracking, model fitting, and camera pose estimation. Prerequisites: ME 322, ENGR 200, and MATH 266. F, even years.

ME 574. Advanced Heat Transfer. 3 Credits.
Advanced conduction in isotropic media in two and three dimensions steady and unsteady problems. Advanced convection including solution of Prandtl Boundary layer equations. Numerical methods, Fourier series, Bessel functions, LaPlace transforms, and error functions. Radioactive heat transfer. Prerequisite: ME 474 or consent of instructor.

ME 575. Conduction and Radiation Heat Transfer. 3 Credits.
Advanced study of conduction and radiation heat transfer. Solution methodologies to classical heat conduction problems will be introduced. Topics include: multidimensional steady conduction via separation of variables and principle of superposition; transient conduction with time-dependent boundary conditions via method of complex temperatures; numerical solutions to heat conduction problems; spectral dependence of radiation; blackbody and gray surface radiation; radiation exchange between surfaces; radiation shield. Prerequisite: ME 474 or consent of instructor.

ME 576. Convective Heat Transfer. 3 Credits.
Advanced study of convective heat transfer, involving developing an understanding of boundary layers, flow in pipes, and convective heat transfer processes. Topics include the concepts of boundary layers, laminar and turbulent flow on surfaces and inside of pipes, and turbulence models. Analytical tools introduced are useful for estimating or bounding heat transfer rates when correlations are not available. Prerequisite: ME 474.

ME 580. Introduction to Autonomous Robotics. 3 Credits.
An introduction to autonomous mobile robots including hardware, modeling, sensors, and basic localization and mapping techniques. Prerequisites: ME 322, ENGR 200, and MATH 266. F, odd years.

ME 590. Special Topics. 1-6 Credits.
Investigation of special topics dictated by student and faculty interests. May be repeated up to a total of 6 credits. Prerequisite: Departmental approval. Repeatable to 6 credits.

ME 591. Research in Mechanical Engineering. 1-6 Credits.
Independent graduate research in Mechanical Engineering. Repeatable to 6 credits. Repeatable to 6 credits.

ME 595. Design Projects. 3-6 Credits.
A three to six credit course of engineering design experience involving individual effort and formal written report. Prerequisites: Restricted to Master of Engineering students and subject to approval by the student's advisor.

ME 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ME 997. Independent Study. 2 Credits.

ME 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Mechanical Engineering at the master's level. Repeatable to 9 credits. Repeatable to 9 credits.

ME 999. PhD Student Doctoral Dissertation. 1-18 Credits.
PhD student doctoral dissertation. Prerequisite: Admission to the PhD in Mechanical Engineering Program and consent of the instructor. Repeatable to 18 credits. S/U grading. F,S,SS.

Undergraduate Courses for Graduate Credit

ME 420. Composite Materials. 3 Credits.
Prerequisites: ME 301 and admission to the professional Mechanical Engineering program. On demand.

ME 426. Mechanical Vibrations. 3 Credits.
Vibration analysis and design as it applies to single and multi degree freedom mechanical systems, isolation and absorption of vibration, vibration of continuous systems, numerical methods of solution. Prerequisites: ENGR 202 with a grade of C or better, MATH 266, and admission to the professional Mechanical Engineering program. S.

ME 428. Advanced Manufacturing Processes. 3 Credits.
Individual projects involving the manufacturing economics and flow charts for selected products and basic technical principles of manufacturing processes. Includes laboratory. Prerequisites: ME 418 and admission to the professional Mechanical Engineering program. On demand.

ME 429. Introduction to Finite Element Analysis. 3 Credits.
Finite element analysis is introduced as a design tool. Emphasis is given to modeling techniques and element types. Matrix methods are used throughout the class. Prerequisites: ENGR 203 with a grade of C and admission to the professional Mechanical Engineering program. On demand.

ME 590. Special Topics. 1-6 Credits.
Investigation of special topics dictated by student and faculty interests. May be repeated up to a total of 6 credits. Prerequisite: Departmental approval. Repeatable to 6 credits.

ME 591. Research in Mechanical Engineering. 1-6 Credits.
Independent graduate research in Mechanical Engineering. Repeatable to 6 credits. Repeatable to 6 credits.

ME 595. Design Projects. 3-6 Credits.
A three to six credit course of engineering design experience involving individual effort and formal written report. Prerequisites: Restricted to Master of Engineering students and subject to approval by the student's advisor.

ME 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ME 997. Independent Study. 2 Credits.

ME 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Mechanical Engineering at the master's level. Repeatable to 9 credits. Repeatable to 9 credits.

ME 999. PhD Student Doctoral Dissertation. 1-18 Credits.
PhD student doctoral dissertation. Prerequisite: Admission to the PhD in Mechanical Engineering Program and consent of the instructor. Repeatable to 18 credits. S/U grading. F,S,SS.
ME 449. Internal Combustion Engines. 3 Credits.
Fundamentals of spark ignition and compression ignition engines, related components and processes. Prerequisites: ME 342 and admission to the professional Mechanical Engineering program. On demand.

ME 451. Heating and Air Conditioning. 3 Credits.
Psychrometrics, heating and cooling loads and analysis of air conditioning systems. Prerequisites: ME 342 and admission to the professional Mechanical Engineering program or consent of instructor. Corequisite: ME 474. On demand.

ME 464. Computational Fluid Dynamics. 3 Credits.
Provides a practical experience using computational fluid dynamics and provides supporting material in fluid dynamics, which is useful in understanding the need to resolve grids in boundary layers and other regions of high velocity gradients. The course is structured as half lecture and half laboratory. The lecture covers topics related to laminar and turbulence boundary layers with and without acceleration, turbulence modeling, wakes and jets. The laboratory provides experience in building grids using the program GAMBIT, the solid/fluid modeling and meshing program, and calculating solutions using FLUENT, a commercial flow solver. Prerequisites: ME 306, MATH 266, and admission to the professional Mechanical Engineering program. On demand.

ME 476. Intermediate Fluid Mechanics. 3 Credits.

ME 477. Compressible Fluid Flow. 3 Credits.
Introduction to the theory and application of one-dimensional compressible flow. Course topics include isentropic flow in converging and converging/diverging nozzles, normal shock waves, oblique shock waves, Prandtl-Meyer flow, flow with friction and heat addition. Prerequisite: Admission to the professional Mechanical Engineering program. Prerequisites or Corequisites: ME 341 with a grade of C or better and ME 306. On demand.

ME 490. Special Laboratory Problems. 1-3 Credits.
Laboratory investigations of interest to students and faculty. Repeatable to maximum of 6 credits. Prerequisites: Consent of instructor and admission to the professional Mechanical Engineering program. Repeatable to 6 credits. On demand.

Petroleum Engineering

http://engineering.und.edu/petroleum/

The Petroleum Engineering program continues to provide students with a personalized education - fostering innovation and emphasizing technical, leadership, and entrepreneurship skills. It supports UND’s efforts to be internationally recognized for excellence in research and teaching - adopting discovery, serving societal needs, and stimulating technology transfer. Additionally, this program is intended to engage the community by promoting engineering and innovation, inspiring young minds, and helping the regional economy thrive through civic responsibility.

The goals that are expected to be achieved in the Master of Engineering program of Petroleum Engineering include the following:

Goal 1: Graduates will have a depth of knowledge in petroleum engineering accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.

Goal 2: Graduates will be able to understand more advance topics, i.e., they will have the skills required to formulate, assess, and document an advanced problem solving approach.

Goal 3: Graduates will be well prepared for advanced professional practice for careers which require creativity, innovation and understanding new topics in engineering or a related field.

Master of Engineering
Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in Petroleum Engineering or closely related field.
2. An overall undergraduate GPA of at least 2.5 or a GPA of at least 2.75 for the last two years.
3. Applicants holding degrees from non-ABET accredited programs/universities must submit scores from the General Test of the Graduate Record Examination.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
1. Course necessary for basic-level ABET accreditation. Normally, graduation from an ABET-accredited institution will satisfy this requirement.
2. A program of study must include the following:
   a. A minimum of 30 semester credit hours.
   b. Three to Six (3-6) semester credit hours of an approved design project.
   c. Fifteen (15) semester credit hours of coursework at the 500 level or above (including the design project).
   d. All major courses must be at the 400-level or above and approved for graduate credit.
3. An overall GPA of 2.75 or better for all coursework.
4. Complete the approved design project.
5. Pass a comprehensive written examination.
6. one peer reviewed manuscript (as first author) submitted with the consent of adviser

Master of Science
Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor of Science degree in Petroleum Engineering or closely related field.
2. An overall undergraduate GPA of at least 3.00 for the last two years.
3. Applicants holding degrees from non-ABET accredited programs/universities must submit scores from the General Test of the Graduate Record Examination.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
1. A minimum of 30 semester credits, including credits granted for the thesis.
2. A minimum of 21 semester credits, including 6 thesis credits, must be in the major field of petroleum engineering.
3. A minor field of study can be obtained by completing 9 semester credits from another department that offers a graduate program. A graduate faculty member from that department must serve on the thesis committee.
4. A cognate can be obtained by completing 9 semester credits from more than one department outside of petroleum engineering, or from a single department that does not offer a graduate program.
5. At least one-half of the credits must be at or above the 500-level.
6. A maximum of one-fourth (usually 8-9 semester credits) of the credits required for the degree may be transferred from another institution.
7. Completion of a research project and its presentation in a thesis.
8. An overall GPA of 3.00 or better in all coursework.
9. The thesis course can be between 6-9 credits with approval of the thesis committee.
10. At least one credit of graduate seminar class is mandatory for each MS student.
11. At least two peer-reviewed conference, journal, or patent applications (as the first author) submitted with the consent of student’s adviser before the time of defense.

Satisfying the School of Graduate Studies’ English Language Proficiency requirements is a condition of admission to the program.
Doctor of Philosophy

Admission Requirements

1. A baccalaureate degree in a related discipline with a GPA of 3.5 or higher or a Master of Science degree in a related discipline with a GPA of 3.0.

2. Satisfy the Graduate School's English Language Proficiency requirements as published in the Graduate Catalog.

3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers Student's Record of Publications, GRE test scores (for students who are applying with a B.S. engineering degree from an non-ABET accredited program), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.

4. Students admitted to an engineering M.S.P.E. program but meeting the minimum requirements in items 1-2 above, may after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the master's degree and work directly toward the Ph.D. degree. The recommendation of the advisory committee shall be brought to a vote by the program graduate committee relevant to the degree track requested by the student. A minimum of one week before such a meeting, the program graduate committee shall be notified and provided with the student's updated file which shall consist of the materials used for application into the M.S.P.E. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered. If the recommendation is approved by the relevant graduate committee, the student will be given the qualifying exam. Passing this exam will advance the student to Approved Status in the Doctoral Program in Petroleum Engineering.

Residence Requirements

The purpose of residence requirements is to provide an opportunity for a sustained and concentrated intellectual effort, to provide for immersion in an academic research environment, and to permit extensive interaction with fellow students and faculty of the Petroleum Engineering Department. Within the first two years of graduate work at UND, at least two consecutive semesters must be completed in residence. During residency, a student must be registered for at least nine credits in a semester, or be a graduate research or teaching assistant taking the appropriate credits to qualify as a full-time student. The remainder of the credits required for a degree can be completed in a manner to accommodate the student's fiscal, family, job related, and other constraints with the consent of the student's advisor. The program of study must be completed within the seven-year period normally allowed for graduate programs.

Under special circumstances, the student in conjunction with his/her advisory committee and the Petroleum Engineering Graduate Committee, can petition the Dean of the School of Graduate Studies for variances in this policy.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Petroleum Engineering Doctoral Program.

The following requirements are in addition to the UND School of Graduate Studies' general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree

2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student

3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.

4. A maximum of 30 credit hours can be transferred from a master's program.

5. A minimum of 30 credit hours must be doctoral research and dissertation.

6. Exactly 3 credit hours of the PE Graduate Seminar must be taken.

7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master's program in fulfilling this requirement subject to the credit transfer limits described in the general section of the graduate catalog). The coursework will include a minimum of 27 credit hours of Petroleum Engineering (or relevance courses with the consent of advisor) coursework selected from the approved list of courses. Equivalent graduate level coursework may be transferred from a master's program.

8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. The qualifying examination includes the following three sections.

Section I

It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate's faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of "provisional pass" for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master's student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II

A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:

1. A literature review of the relevant field of research related to the project
2. proposed methods
3. preliminary results (simulation or experiment)
4. the objectives of the proposed project, and
5. tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above components will be evaluated and graded (0 to 100). To pass the written exam, students must earn a minimum of 75/100 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade, a date can be scheduled for an oral presentation, i.e., Section III. If failed, the student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III

An oral comprehensive examination should be presented to the committee on the research topics described in the above Section II. Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of "provisional pass" will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than six months as specified by the student committee. Students who fail an exam a second time may request to be reclassified as a master's student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

1. After successful completion of the written research proposal and oral presentation, an annual oral progress report should be presented to the committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.
Courses

PTRE 511. Advanced Petroleum Engineering Labs. 4 Credits.
Studying the major tech research equipment for petroleum reservoir characterization, such as: X-Ray Diffraction, X-Ray Fluorescence, Scanning Electron Microscope, Advanced Multifunctioning Tri-axial Cell, Servo-control Uniaxial Testing machine and Nuclear Magnetic Resonance core testing. The students will learn the concepts and physics behind the tool, the purpose of using the equipment and how to operate the machines individually. Prerequisite: Department Consent Required. S, odd years.

PTRE 521. Advanced Production Engineering. 3 Credits.
Using nodal analysis for design, evaluation, and optimization of petroleum production systems, artificial lift, surface separation and treating facilities. It also covers: Formation damage control and evaluation, skin effects and calculation, well stimulation and well performance. Prerequisite: Department Consent Required. F, odd years.

PTRE 531. Reservoir Geomechanics. 3 Credits.
Various ranges of applications of geomechanics related to reservoir engineering will be covered in this course. This will include the depletion and injection, induced stresses and their effects on both reservoir and surrounding rocks, the impact of production on compaction, subsidence, and reactivation of faults and, sand production and casing collapse, and the process of hydraulic fracturing. Prerequisite: Department Consent Required. S, even years.

PTRE 541. Data Mining in Petroleum Engineering. 3 Credits.
This course will provide students with the fundamentals of data mining and soft computing methodologies and their applications in the petroleum industry. Students will become familiar with data mining system architecture, concepts and tasks such as data processing, data integration and classification techniques. Special emphasis will be given to presenting common knowledge discovery tools. Prerequisite: Department Consent Required. S, even years.

PTRE 555. Pressure Transient Analysis. 3 Credits.
Diffusivity equation and solutions for slightly compressible liquids; dimensionless variables; type curves; applications of solutions to buildup, drawdown, multi-rate, interference, pulse and deliverability tests; extensions to multiphase flow; analysis of hydraulically fractured wells. Prerequisite: Department Consent Required. S, odd years.

PTRE 561. Natural Gas Engineering. 3 Credits.
Estimation of gas properties for well test or production data analysis using accurate correlations and laboratory data, development of material balance analyses for gas reserve calculation, production and reservoir characteristics of gas and gas-condensate reservoirs. Prerequisite: Department Consent Required. S, odd years.

PTRE 571. Petroleum Geostatistics. 3 Credits.
A review of classical statistics and its applications in petroleum engineering is discussed. The fundamentals of spatial statistics is presented followed by the concept of variogram and its different models, estimation variance, different interpolation methods including Kriging and how they differ from each other. Practical example are presented with the real data from petroleum industry. Prerequisite: Department Consent Required. F, even years.

PTRE 581. Reservoir Geophysics. 3 Credits.
This multidisciplinary course addresses different topics in exploration workflow in implemented in the petroleum industry for oil and gas discovery. Various exploration techniques for locating hydrocarbon reservoirs and estimating their sizes is discussed. Prerequisite: Department Consent Required. S, even years.

PTRE 593. Selected Topics in Petroleum Engineering. 1-4 Credits.
Detailed study of selected topics in Petroleum Engineering. Includes laboratory if applicable. Repeatable up to a maximum of 4 credits. Prerequisite: Consent of instructor. Repeatable to 12 credits. On demand.

PTRE 595. Design Project. 3-6 Credits.
Design project is for non-thesis based Master's students. Prerequisite: Department Consent Required. Repeatable to 6 credits. F.

PTRE 598. Enhanced Oil Recovery. 3 Credits.
Fundamentals and theory of enhanced oil recovery; polymer flooding, surfactant flooding, miscible gas flooding and steam flooding; application of fractional flow theory; strategies and displacement performance calculations. Prerequisite: Instructor's consent. S.

PTRE 599. Research. 1-4 Credits.
Analysis, planning, and detailed study of definite problems; individual laboratory work on some selected problems in the field of Petroleum Engineering to develop the power of independent investigation. Prerequisite: Department Consent. Repeatable to 30 credits. F,S,SS.

PTRE 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Petroleum Engineering at the master's level. Repeatable to 9 credits. F,S,SS.

PTRE 999. Dissertation. 1-18 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Petroleum Engineering at the doctoral level. Repeatable to 18 credits. F,S,SS.

English Language and Literature

http://arts-sciences.und.edu/english/

FACULTY: Alberts, Bagier, Beard, Carson, Conway, Czerwiec, Dixon, Donehower, Flynn, Harris, Huang, Kitzes, Koepke, Nelson (Graduate Program Director), O’Donnell, Ommen, Pasch, Robison, Sauer, Shafer, Weaver-Hightower and Wolfe (Chair)

Degrees Granted: Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.)

The University of North Dakota Department of English offers a varied program of studies in English and American literature, writing, and the English language. The academic atmosphere is intimate, class size for graduate courses is small, and students are encouraged to work closely with members of the graduate faculty. The curriculum varies from year to year and includes courses in genres, periods, specific authors, critical theory, rhetoric/composition, interdisciplinary study, creative writing, cinema/film theory, linguistics, and research methods. Faculty in the Department also work in interdisciplinary areas such as American Studies, Peace Studies, Composition Studies, American Indian Studies, and Women Studies. The Department works closely with the University’s College of Education and Human Development in the area of English Education. In all areas of work, students are encouraged to utilize a variety of critical and theoretical approaches.

The Department sponsors an annual week-long writers conference that gives graduating students a chance to hear contemporary writers read their work and discuss the writing process. Visitors have included Salman Rushdie, Czeslaw Milosz, Louise Erdrich, Larry McMurtry, Leslie Silko, James Welch, August Wilson, Luisa Valenzuela, Peter Matthiessen, Tim O’Brien, Ursula Hegi, Barry Lopez and Mary Gaitskill.
Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

**Master of Arts (M.A.) Mission Statement and Program Goals**

Through the work of research, service, and teaching, The Department of English is committed to the premise that language and literature reflect and shape the world in which we live. Faculty members conduct ongoing research in an array of sub-fields and interdisciplinary contexts and contribute to academic conversations occurring among humanities scholars on national and international levels. The nationally renowned Writers Conference brings great authors and opportunities for literary discussion to the larger community. Teaching at a wide range of levels, from first-year writers to Ph.D. students, the Department demonstrates the pleasures and value of a liberal arts education by emphasizing critical and creative thinking, by helping students think thoughtfully about cultural diversity, and by teaching strong written communication skills. In the Department of English, students at all levels of the curriculum are prepared for lives of public citizenship as they learn to analyze texts within complex cultural situations, to write and to think rhetorically, and to engage with diverse perspectives.

The Master of Arts in English stresses the acquisition of a broad foundation of discipline-specific knowledge and critical tools. To this end, the Department provides quality graduate instruction in literature in English, literary criticism and theory, the English language, composition and rhetoric studies, creative writing, cultural studies, and related fields. Successful M.A. students will be prepared, on the one hand, to pursue further graduate education in English, Law, or any other field that requires highly developed verbal, analytical, and rhetorical skills, and, on the other hand, to seek careers as writing teachers, creative writers, editors, or in a variety of other professions.

- Students will develop the critical skills and tools necessary to produce independent, analytical or creative work in English studies.
  - Students use analytical or creative techniques that are associated with current work in English studies.
  - Students situate their own written work within current debates in English studies.

- Students will use techniques—creative or critical—integral to the production of writing in English studies.
  - Students use the rhetorical conventions of English studies.
  - Students use revision to develop and refine their writing projects.

- Graduate Teaching Assistants will demonstrate the ability to teach college-level writing effectively.
  - Students develop a range of teaching strategies.
  - Students recognize the connections between particular teaching strategies and larger learning objectives.
  - Students situate their own teaching practices in the context of significant pedagogical debates.

**Doctor of Philosophy (Ph.D.) Mission Statement and Program Goals**

Through the work of research, service, and teaching, the Department of English is committed to the premise that language and literature reflect and shape the world in which we live. Faculty members conduct ongoing research in an array of sub-fields and interdisciplinary contexts and contribute to academic conversations occurring among humanities scholars on national and international levels. The nationally renowned Writers Conference brings great authors and opportunities for literary discussion to the larger community. Teaching at a wide range of levels, from first-year writers to Ph.D. students, the Department demonstrates the pleasures and value of a liberal arts education by emphasizing critical and creative thinking, by helping students think thoughtfully about cultural diversity, and by teaching strong written communication skills. In the Department of English, students at all levels of the curriculum are prepared for lives of public citizenship as they learn to analyze texts within complex cultural situations, to write and to think rhetorically, and to engage with diverse perspectives.

The Doctor of Philosophy in English stresses the acquisition not only of a broad foundation of discipline-specific knowledge and critical tools, but also the depth of knowledge necessary to build fluency and expertise within an area of specialization. To this end, the Department provides quality graduate instruction in literature in English, literary criticism and theory, the English language, composition and rhetoric studies, creative writing, cultural studies, and related fields. Successful Ph.D. students will be prepared to seek careers as college and university faculty, writing teachers, creative writers, editors, or in a variety of other professions that require highly developed verbal, analytical, and rhetorical skills.

- Students will produce significant, independent work in English studies and/or creative writing.
  - Students develop a specialization through which they position themselves as members of a disciplinary community.
  - Students produce work that contributes to debates in English studies and/or demonstrate connections between creative work and literary traditions.
  - Students demonstrate advanced writing and analytical skills to meet a variety of rhetorical goals.

- Students will demonstrate both breadth and depth of knowledge about disciplinary subfields, major works, and influential critical approaches in English studies.
  - Students demonstrate an awareness of significant issues in selected disciplinary subfields.
  - Students demonstrate an understanding of the cultural and social contexts in which literary works are produced.
  - Students demonstrate an understanding of the critical tools and strategies that shape the reception of literary works and the production of English studies as a discipline.

- Graduate Teaching Assistants will be prepared to teach effectively a range of courses in the field of English studies.
  - Students use a variety of teaching strategies.
  - Students recognize and evaluate the connections between particular teaching strategies and larger learning objectives.
  - Students situate and evaluate their own teaching practices within the context of significant pedagogical debates.

**Master of Arts (M.A.) Admission Requirements**

Applications for admission must be completed by February 1 for full consideration and Teaching Assistantships. The applicant must meet the School of Graduate Studies current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor's degree from a recognized college or university.
2. Twenty semester credits of English beyond the communication requirement with a 3.00 grade point average or better.
3. A writing sample of 10-15 pages on topics or in modes appropriate to the proposed program of study (submitted directly to the department).
4. Graduate Record Examination General Test required. Literature in English Advanced Test is recommended.
5. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the English Language and Literature Department.

**Thesis Option**

1. A minimum of thirty credit hours are needed for the M.A., including the required courses listed below, the thesis (4 credits), and any Readings/Research courses (maximum 4 credits).
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. ENGL 500 Introduction to Graduate Studies; ENGL 501 Teaching College English and ENGL 501L Teaching College English Laboratory (for Graduate Teaching Assistants only); and either ENGL 510 History of Literary Criticism or ENGL 511 Problems in Literary Criticism. Courses must be completed with grades of A or B (S for ENGL 501L Teaching College English Laboratory).

5. Up to 4 credits of Readings and Research courses (ENGL 590 Readings and ENGL 593 Research) may be used to supplement the standard graduate offerings.

6. Evidence of the mastery of scholarly tools appropriate to the proposed field of studies is required, including proficiency in one language other than English.

7. Four credits are allowed for the thesis.

8. Required courses:

    | Course Code | Course Title                           | Credits |
    |-------------|----------------------------------------|---------|
    | ENGL 500    | Introduction to Graduate Studies       | 2       |
    | ENGL 501    | Teaching College English              | 3       |
    | ENGL 501L   | Teaching College English Laboratory   | 1       |
    | ENGL 510    | History of Literary Criticism         | 3       |
    | or ENGL 511 | Problems in Literary Criticism        |         |
    | Electives   |                                        | 14-17   |
    | ENGL 998    | Thesis                                 | 4       |

Total Credits: 27-30

Non-Thesis Option

1. A minimum of thirty-two credit hours are needed for the M.A., including the required courses listed below, ENGL 598 Portfolio Workshop and ENGL 995 Scholarly Project, and any Readings/Research courses (maximum 4 credits).

2. At least one-half of the credits must be at or above the 500-level.

3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.

4. ENGL 500 Introduction to Graduate Studies; ENGL 501 Teaching College English and ENGL 501L Teaching College English Laboratory (for Graduate Teaching Assistants only); and either ENGL 510 History of Literary Criticism or ENGL 511 Problems in Literary Criticism. Courses must be completed with grades of A or B (S for ENGL 501L Teaching College English Laboratory).

5. Up to 4 credits of Readings and Research courses (ENGL 590 Readings and ENGL 593 Research) may be used to supplement the standard graduate offerings.

6. Evidence of the mastery of scholarly tools appropriate to the proposed field of studies is required, including proficiency in one language other than English.

7. The Critical Introductory Statement to the Portfolio will serve as the written comprehensive exam.

8. Required courses:

    | Course Code | Course Title                           | Credits |
    |-------------|----------------------------------------|---------|
    | ENGL 500    | Introduction to Graduate Studies       | 2       |
    | ENGL 501    | Teaching College English              | 3       |
    | ENGL 501L   | Teaching College English Laboratory   | 1       |
    | ENGL 510    | History of Literary Criticism         | 3       |
    | or ENGL 511 | Problems in Literary Criticism        |         |
    | Electives   |                                        | 15-18   |
    | ENGL 995    | Scholarly Project                      | 2       |

Total Credits: 29-32

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.

2. Twenty semester credits of English beyond the communication requirement with a 3.00 grade point average or better.

3. Undergraduate work in at least one language other than English equivalent to the first two college-level years or by demonstrating (by Educational Testing Service or by Languages Department examination) a reading knowledge of one language other than English or the satisfactory completion of two semesters each of two languages other than English. In some cases, students may be admitted without the language requirement and may complete it as part of the MA. program.

4. A writing sample of 10-15 pages on topics or in modes appropriate to the proposed program of study (submitted directly to the department). Applicants who plan to major in creative writing should also submit an analytical paper.

5. Graduate Record Examination General Test required. Literature in English Advanced Test is recommended.

6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

7. A master’s degree of at least 30 semester credits of courses in literature and English language or in an acceptable combination of these and related subjects. (Graduate courses taken elsewhere may, at the discretion of the Department, be accepted in lieu of courses that would otherwise be related at the University of North Dakota.)

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the English Language and Literature Department.

1. ENGL 500 Introduction to Graduate Studies; ENGL 501 Teaching College English and ENGL 501L Teaching College English Laboratory (for Graduate Teaching Assistants only); and either ENGL 510 History of Literary Criticism or ENGL 511 Problems in Literary Criticism. Courses must be completed with grades of A or B (S for ENGL 501L Teaching College English Laboratory).

2. Up to ten credits in addition to the four credits allowed for the M.A. may be in Readings and Research courses.

3. ENGL 590 Readings 1-4

4. Evidence of the mastery of scholarly tools appropriate to the proposed field of studies is required, including proficiency in one language other than English to Level IV. Additional language study and/or other scholarly tools may be required as deemed appropriate by the student in consultation with his/her mentor, advisory committee, and the Director of Graduate Studies.

5. Completion of the comprehensive examinations, in areas or topics relevant to a student’s individual interests as recommended by the student’s Advisory Committee. These will include three written comprehensive exams: 1) a written major field exam; 2) a written second field exam; and 3) a written special topic exam. The major and second field exams provide the kind of breadth of knowledge that goes beyond that developed through graduate coursework alone while the special topic exam is designed to begin the thought process necessary to conceptualizing and completing the dissertation. A fourth exam, an oral exam on the dissertation prospectus, is scheduled and completed within six months after completion of the written exams.

6. Fifteen (15) hours of credit may be granted for the dissertation, which may take the form of either a closely focused scholarly-critical investigation of a single topic, a creative work or group of works, or a number of related, publishable essays (critical, scholarly, bibliographical, methodological, pedagogical) which may be developed in combination with a project or projects deemed appropriate and acceptable by the student’s Advisory Committee.

NOTE: Students may be recommended for advancement to candidacy for the doctoral degree only after they have satisfied the following requirements in addition to those required by the School of Graduate Studies: Completion of ENGL 500 Introduction to Graduate Studies and either ENGL 510 History of Literary Criticism or ENGL 511 Problems in Literary Criticism with grades of A or B; for Graduate Teaching Assistants, ENGL 501 Teaching College English with a grade of A or B and ENGL 501L Teaching College English Laboratory with a grade of S.
Courses

ENGL 500. Introduction to Graduate Studies. 2 Credits.
Required of all candidates for advanced degrees in English. An introduction to graduate study and the profession.

ENGL 501. Teaching College English. 3 Credits.
An introduction to theories and methods of teaching college English. Required of Graduate Teaching Assistants in English.

ENGL 501L. Teaching College English Laboratory. 1 Credit.

ENGL 510. History of Literary Criticism. 3 Credits.
A history of European criticism from the Classical Greek period to the present day, with emphasis on major texts.

ENGL 511. Problems in Literary Criticism. 3 Credits.
A course in applied criticism. Repeatable when topics vary. Repeatable.

ENGL 516. Creative Writing: Fiction Workshop. 3 Credits.
Allows students to receive graduate-level instruction in a workshop setting, meeting regularly with other students, sharing their work, and critiquing one another's work. The purpose of this course is to enable the student to produce fiction of professional quality, such as that needed for a graduate thesis in creative writing. Repeatable to a total of 6 credits for M.A. students, 9 credits for Ph.D. students. Prerequisite: Upper-division undergraduate work in creative writing or permission of instructor. Repeatable to 6 credits.

ENGL 517. Creative Writing: Poetry Workshop. 3 Credits.
This course allows students to receive graduate-level instruction in a workshop setting, meeting regularly with other students, sharing their work, and critiquing one another's work. The purpose of this course is to enable the student to produce poetry of professional quality, such as that needed for a graduate thesis in creative writing. Repeatable to a total of 6 credits for M.A. students, 9 credits for Ph.D. students. Prerequisites: ENGL 413 or 414, upper-division undergraduate work in creative writing or permission of instructor. Repeatable to 6 credits.

ENGL 520. Studies in English Literature. 1-3 Credits.
The subject of study will vary from semester to semester, and the course may be repeated for credit when the subject of study differs. Repeatable.

ENGL 521. Studies in American Literature. 1-3 Credits.
The subject of study will vary from semester to semester, and the course may be repeated for credit when the subject of study differs. Repeatable.

ENGL 522. Studies in English Language. 1-3 Credits.
The subject of study will vary from semester to semester, and the course may be repeated for credit when the subject of study differs. Repeatable.

ENGL 524. Studies in Creative Writing. 3 Credits.
Topics vary, such as advanced workshops in different genres and "reading for writers," studying the works of published writers as models for students’ own creative work. Prerequisites: ENGL 516 or ENGL 517, or consent of instructor. Repeatable.

ENGL 525. Studies in Composition and Rhetoric. 3 Credits.
This course investigates selected topics in composition and rhetorical studies. The subject of study will vary from semester to semester, and the course may be repeated for credit when the subject of study differs. Repeatable to 12 credits. On demand.

ENGL 531. Seminar in English Literature. 3 Credits.
This class requires the preparation and delivery of a long research paper on an appropriate topic. Repeatable. Repeatable.

ENGL 532. Seminar in American Literature. 3 Credits.
Similar in method to English 531. Repeatable. Repeatable.

ENGL 533. Seminar in English Language. 3 Credits.
Similar in method to English 531. Repeatable. Repeatable.

ENGL 590. Readings. 1-4 Credits.
American Literature; Cinema; English Literature; English Language; or Creative Writing. Supervised independent study. Repeatable. Prerequisites: ENGL 500 and department consent. Repeatable.

Undergraduate Courses for Graduate Credit

ENGL 591. Readings for Ph.D. Comprehensive Examinations. 1-4 Credits.
Supervised independent study on approved topics. Repeatable for a maximum of 6 credits. This course is exempt from the normal "Incomplete" reversion schedule. A grade is assigned upon completion of the appropriate comprehensive examination. Prerequisites: Department consent. Repeatable to 12 credits.

ENGL 593. Research. 1-4 Credits.
American Literature; Cinema; English Literature; English Language; or Creative Writing. Independent study of a problem in the field resulting in a long research paper or a series of short reports. Repeatable. Prerequisites: ENGL 500 and department consent. Repeatable.

ENGL 598. Portfolio Workshop. 3 Credits.
This course is designed to further explore the rhetorical strategies of academic writing in the discipline of English and to support students through the development of the Portfolio thesis. Permission of Director of Graduate Studies is required. Prerequisite: Permission of Graduate Director. S/U grading.

ENGL 599. Special Topic. 1-3 Credits.
A course on varying topics. Repeatable. F.S.

ENGL 995. Scholarly Project. 2 Credits.
As a common course number uniform throughout the graduate school, English 995 Scholarly Project will serve the purpose described in the graduate catalog as a required component of the non-thesis option in fulfillment of the M.A. degree. F.S,SS.

ENGL 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

ENGL 997. Independent Study. 2 Credits.
Repeatable to 4 credits.

ENGL 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

ENGL 408. Writing for Digital Environments. 3 Credits.
Advanced writing in and for digital platforms. Prerequisite: ENGL 120 or ENGL 125 or ENGL 130. On demand.

ENGL 409. Art of the Cinematic Drama. 3 Credits.
An investigation of the aesthetics of the film drama with a concentration on the theory and evaluation of the medium. This course examines the relationship of the verbal and visual arts. Repeatable when topics vary. Prerequisite: ENGL 225. Repeatable. S.

ENGL 410. Studies in Literary Periods. 3 Credits.
Period-specific study of literature. Repeatable if topics vary. Repeatable to 12 credits. On demand.

ENGL 413. The Art of Writing: Poetry. 3 Credits.
Intermediate and advanced-level study and practice of poetry-writing. Repeatable once. Prerequisite: ENGL 226 or instructor's permission. Repeatable to 6 credits. F.

ENGL 414. The Art of Writing: Fiction. 3 Credits.
Continues the work of ENGL 306, Creative Writing: Fiction, at the advanced level. Prerequisite: ENGL 306 or instructor's permission. Repeatable to 6 credits. S.

ENGL 415. Seminar in Literature. 1-4 Credits.
A course for advanced students on topics varying from year to year. Repeatable. Repeatable. S.

ENGL 418. Second Language Acquisition. 3 Credits.
This course focuses on recent second language acquisition (SLA) research findings from the areas of linguistics, psychology, education, and communication and on how to relate these findings to language learning and teaching. Prerequisite: ENGL 209. S.

ENGL 419. Teaching English as a Second Language. 3 Credits.
An introduction to the principles of teaching English as a second language, with special attention to tutoring. Prerequisite: ENGL 209. F.
ENGL 428. Digital Humanities. 3 Credits.
Examines the growing necessity for digital products in the humanities and moves the concept of publishing from hard copy to electronic copy. Students will have hands-on opportunities to create new knowledge by working on projects across campus such as digitizing materials in the library's special collections department and working directly with professors' research initiatives. F, even years.

ENGL 442. History of the English Language. 3 Credits.
The development of the language from the earliest times to the present. This course is recommended for all prospective English teachers. S.

Geography and Geographic Information Science
http://arts-sciences.und.edu/geography

FACULTY: Atkinson, Munski (Graduate Director), Niedzielski, Rundquist, Todhunter, Vandeberg (Chair) and Wang (Graduate GISc Certificate Director)

Degrees Granted: Master of Science (M.S.), Master of Arts (M.A.) and Certificate in Geographic Information Science (GISc)

The Geography & GISc Department graduate program includes both thesis and non-thesis options leading to the M.S. and M.A. degrees, and a Certificate in Geographic Information Science. The principle areas of concentration are community and urban development, environmental geography, geographic education, and geospatial techniques. The graduate programs provide close student-faculty interaction, easy access to current computer technology and field equipment, a broad liberal arts academic setting, and an abundant number of research topics within the American Great Plains and Canadian Prairie Provinces. In addition, the department offers an array of courses in geospatial technologies to allow students to build expertise in GIS, remote sensing, cartography and spatial analysis. Prospective graduate students are encouraged to apply by February 1 (for Fall enrollment) and October 15 (for Spring enrollment) of each year to receive fullest consideration for acceptance and funding. Prospective students interested in the Certificate in Geographic Information Sciences should apply by April 1.

The M.S. option in environmental geography reflects a geographic focus on land use, and land use change, climatology, water resources, human impact, biogeography, geomorphology, and landscape ecology. Students follow a sequence of required and elective courses that reflect an environmental emphasis. The M.S. program prepares students for doctoral study or a professional career in government, industry, or education in a wide variety of environmentally-related fields. Students also must take cognate or minor courses in biology, geology, atmospheric sciences, or other related fields.

The M.A. option in community and urban development emphasizes the background education students need to enter careers in community development, local economic development, land use planning, federal government service, historic preservation, and travel and tourism. This option also provides the background for those students wishing to pursue a doctoral degree in human geography. Students in the M.A. option take a selection of courses in population, economic, social, urban, cultural, historical, and regional geography. They also can take minor or cognate courses in business and public administration, international relations, anthropology and archaeology, sociology, languages, and other fields appropriate to their goals.

The Certificate in Geographic Information Science (GISc) gives students a solid theoretical foundation in GISc and the state-of-the-art technical skills needed for a successful career in GISc. Graduates with skills in GISc are in demand in the private and government sectors dealing with human development, environmental management, business, and geographic education at all levels. Students seeking the certificate must be admitted as a graduate student to UND, although students interested in taking only one or more of the courses in the certificate can apply as a non-degree-seeking student. The certificate is designed to serve: a) students pursuing a graduate degree from UND who wish to also pursue the GISc certificate and b) non-degree-seeking professionals already holding a baccalaureate degree who seek to "re-tool." The 12-credit program (9 credits of required courses and 3 of electives) is designed so that on-campus students can complete the necessary certificate course work in 2 years or less. The online version of the program has the same objectives as the on-campus program. However, the online certificate is designed for non-degree-seeking students and working professionals off campus. It focuses on a tight core curriculum that can be completed in 12 months.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)
Mission Statement and Program Goals
The mission of the Department of Geography & GISc’s Master of Science graduate degree program is to provide a solid foundation in the concepts and theories of physical geography. Furthermore, the program seeks to develop skills in the use of geospatial technologies, that will prepare students for careers in natural resources management, geoscience, federal government service, and geographic information science, or for doctoral work in physical geography.

Goal 1: Students will be able to create new knowledge and apply geographic techniques to solve geographic problems related to natural resources management and the geosciences.

Goal 2: Students will exhibit a fundamental understanding of the breadth, depth, and integration of geography.

Goal 3: Students will be able to integrate their learning in geography to the broader world.

Master of Arts (M.A.)
Mission Statement and Program Goals
The mission of the Department of Geography & GISc’s Master of Arts graduate degree program is to provide a solid foundation in the concepts and theories of human geography, and to prepare students for careers in community and local economic development, land use planning, federal government service, historic preservation, geographic information science, and travel and tourism, or for doctoral work in human geography.

Goal 1: Students will be able to create new knowledge and apply geographic techniques to solve geographic problems related to community and local economic development and land use planning.

Goal 2: Students will exhibit a fundamental understanding of the breadth, depth, and integration of geography.

Goal 3: Students will be able to integrate their learning in geography to the broader world.

Certificate in Geographic Information Science (GISc)
Mission Statement and Program Goals
The mission of the graduate Certificate in GISc is to provide a solid theoretical foundation in GISc and state-of-the-art technical skills that prepare students to meet the GISc workforce demands of academia, government, and private industry.

Goal 1: Students will exhibit a fundamental understanding of core concepts and principles of GISc.

Goal 2: Students will be able to design effective maps.

Goal 3: Students will be able to solve spatial problems using GISc.

Goal 4: Students will be able to conduct applied research projects using geospatial technology tools.
Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.
2. A GPA of at least 3.00 in all undergraduate work.
3. A minimum of 9 semester credits of undergraduate coursework in geography, preferably physical geography. An additional 6 credits in the fields cognate to geography are required.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. International applicants who have received their bachelor’s or master’s degree in the United States or English speaking Canada are not required to submit the TOEFL or IELTS.
6. Meet all School of Graduate Studies requirements for admission.

Outstanding applicants are evaluated on an individual basis and those with limited background in geography but a distinguished record in another discipline may be accepted in a qualified or provisional status.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Geography Department.

1. Four required courses:
   - GEOS 500 Graduate Studies in Geography 1
   - GEOS 501 Geographic Thought Through Time 2
   - GEOS 576 Field Methods and Analysis in Geography 3
   - GEOS 578 Geographic Research and Writing 2
   Total Credits 8

2. A minor or cognate area of study, and a graduate program of study that reflects the student’s focus on physical geography topics (9 credits). Cognate courses must be from at least two academic departments outside Geography.

Thesis

1. A minimum of 30 semester credits, including 9 semester credits for approved minor or cognate courses.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
4. Preparation and successful defense of a thesis. (A minimum of 6 credits for GEOS 998 Thesis.)

Non-Thesis

1. A minimum of 36 semester credits, including 9 semester credits for approved minor or cognate courses.
2. A minimum of 12 credits that focus upon geospatial skills and techniques which include quantitative methods, computer graphics and mapping, geographic information systems, remote sensing, field methods, and cartography. The non-thesis programs emphasize development of geospatial skills that can be applied to specific problems and projects that may or may not involve research.
3. Two credits of GEOS 997 Independent Study are required.
4. At least one-half of the credits must be at or above the 500-level.
5. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
6. Preparation of a written independent study approved by the faculty advisor.
7. Comprehensive final examination.

Master of Arts (M.A.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.
2. A GPA of at least 3.00 in all undergraduate work.
3. A minimum of 9 semester credits of undergraduate coursework in geography, preferably in human geography. An additional 6 credits in fields cognate to geography are also required. Cognate courses must be from at least two academic departments outside Geography.
4. Meet all School of Graduate Studies requirements for admission.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Outstanding applicants are evaluated on an individual basis and those with limited backgrounds in geography but a distinguished record in another discipline may be accepted in a qualified or provisional status.

Degree Requirements

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Geography Department.

1. Four required courses:
   - GEOS 500 Graduate Studies in Geography 1
   - GEOS 501 Geographic Thought Through Time 2
   - GEOS 576 Field Methods and Analysis in Geography 3
   - GEOS 578 Geographic Research and Writing 2
   Total Credits 8

2. A minor or cognate area of study, and a graduate program of study that reflects the student’s focus on human geography topics (9 credits).

Thesis

1. A minimum of 30 semester credits, including 9 semester credits for approved minor or cognate courses.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.

Non-Thesis

1. A minimum of 36 semester credits, including 9 semester credits for approved minor or cognate courses.
2. A minimum of 12 credits that focus upon geospatial skills and techniques which include quantitative methods, computer graphics and mapping, geographic information systems, remote sensing, field methods, and cartography. The non-thesis programs emphasize development of geospatial skills that can be applied to specific problems and projects that may or may not involve research.
3. A minimum of two credits of GEOS 997 Independent Study
4. At least one-half of the credits must be at or above the 500-level.
5. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
6. Preparation of a written independent study approved by the faculty advisor.
7. Comprehensive final examination.

Certificate in Geographic Information Science (GIsc)

The Geography department offers a graduate certificate in Geographic Information Science (GIsc). GIsc is the foundation of Geographic Information Systems (GIS), which integrate spatial data sets in the form of digital maps, digital aerial photos, satellite imagery, and global positioning system (GPS).
coordinates. The goal of GISc is to model landscapes digitally and to enable the characterization of spatial and temporal processes.

Certificate students must be admitted to UND as either full or part-time graduate students. Application for admission must be made to the UND School of Graduate Studies. The certificate is designed to serve:

1. non-geography graduate students currently pursuing a graduate degree from UND, and
2. non-degree-seeking professionals already holding a graduate and/or baccalaureate degree who seek to “re-tool.”

The courses taken in a previously completed GISc certificate program may be applied to a Master’s degree in Geography.

**Admission Requirements**

1. A baccalaureate degree from an accredited university.
2. A GPA of at least 2.75 in all undergraduate work.

**Certificate Requirements**

Successful completion of the 12-credit GISc Certificate requires the following:

1. Completion of the nine credits of core courses (see below).
2. Completion of at least three credit hours of elective courses (see below).
3. A minimum grade point average of 3.00.
4. Completion time of no more than five years.
5. **Required Core Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 471</td>
<td>Cartography and Visualization</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Geographic Information Systems (GIS) &amp; GIS Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 574</td>
<td>Advanced Techniques in Geographic Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

**Elective Courses**

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 377</td>
<td>Quantitative Applications in Geography and Spatial Analysis Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 475</td>
<td>Digital Image Processing</td>
<td></td>
</tr>
<tr>
<td>GEOG 476</td>
<td>Selected Topics in Geographic Information Systems</td>
<td></td>
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<tr>
<td>GEOG 575</td>
<td>Seminar in Remote Sensing</td>
<td></td>
</tr>
<tr>
<td>GEOG 591</td>
<td>Directed Study in Geographical Problems</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits**: 12

**Courses**

GEOG 500. Graduate Studies in Geography. 1 Credit.
An overview of contemporary research in geography. Includes a field trip and discussions on the differences between graduate and undergraduate education, as well as strategies for successful completion of a graduate degree.

GEOG 501. Geographic Thought Through Time. 2 Credits.
Required of all graduate students. A scholarly examination of the scope and content of geography from its inception to the present.

GEOG 521. Advanced Physical Geography. 3 Credits.
An investigation of an advanced topic in physical geography. May be repeated if a different topic is examined. Prerequisite: Instructor consent. Repeatable.

GEOG 537. Graduate Cooperative Education. 1-3 Credits.
Practical experience of applying advanced concepts of geography. Experience will vary from student to student and must be coordinated with co-op host. Prerequisites: MS/MA students must have minimum of 12 graduate credits and permission of department chair or co-op coordinator.

GEOG 551. Advanced Human Geography. 3 Credits.
An investigation of an advanced topic in human geography. May be repeated if a different topic is examined. Prerequisite: Instructor consent. Repeatable.

GEOG 574. Advanced Techniques in Geographic Information Systems. 3 Credits.
An advanced course designed to extend GIS knowledge and experience and to prepare students to become effective GIS analysts. The course follows a hands-on, problem-solving approach that integrates the interests and analytical needs to participating students. Prerequisite: GEOG 474 or an equivalent approved by the department.

GEOG 575. Seminar in Remote Sensing. 3 Credits.
A seminar in the analysis of remote sensing techniques as applied to contemporary research problems in geography. Prerequisite: GEOG 475 or consent of instructor.

GEOG 576. Field Methods and Analysis in Geography. 3 Credits.
An advanced, intensive approach to the measuring and mapping of cultural and physical features of the earth in the field. Familiarization with the practical problems involved in data collection techniques in rural as well as urban areas and transfer of the pattern of phenomena of an area to a scale suitable for mapping.

GEOG 578. Geographic Research and Writing. 3 Credits.
Required of all graduate students. Orientation to methods of research and communication in geography. Emphasis upon research design, identification of bibliographic and geographic source materials, communication skills, and proposal writing. Prerequisite: Graduate standing. S.

GEOG 591. Directed Study in Geographical Problems. 1-4 Credits.
Directed advanced research in a specialized field of geographic study. May be repeated up to a total of 9 credits. Prerequisite: Consent of instructor. Repeatable to 9 credits. F.S.S.

GEOG 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOG 997. Independent Study. 2 Credits.

GEOG 998. Thesis. 1-6 Credits.
Repeatable to 6 credits.

**Undergraduate Courses for Graduate Credit**

GEOG 377. Quantitative Applications in Geography. 2 Credits.
Application of statistical and mathematical techniques to research topics in geography. Prerequisite: MATH 103 or consent of instructor. F.

GEOG 377L. Spatial Analysis Laboratory. 1 Credit.
Practical applications of statistical and mathematical techniques for geographic problems. Students work on projects which involve solving problems by spatial-oriented computations Use of relevant statistical programs on computers are emphasized. Prerequisite: MATH 103. Corequisite: GEOG 377. F.

GEOG 421. Selected Topics in Physical Geography. 3 Credits.
An examination of an advanced physical geography topic chosen from field methods, biogeography, human impact on the environment, physiography, or others. Repeatable to nine credits if different topics are examined. Prerequisite: GEOG 121 or consent of instructor. Repeatable to 9 credits. F,S.

GEOG 452. Selected Topics in Economic Geography. 3 Credits.
Selected topics in economic geography including but not limited to industrial location, transportation, rural economic development, and others. Repeatable to nine credits if different titles are examined. Prerequisite: GEOG 151 or consent of instructor. Repeatable to 9 credits. On demand.

GEOG 453. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. On demand.

GEOG 455. Geopolitics. 3 Credits.
Geographic analysis of the global political system and the significance of the nation-state, intergovernmental organizations, globalization, free trade, and terrorism with consideration of the broad political, social cultural, and economic contexts of world disputes. Prerequisite: GEOG 250 or consent of instructor. On demand.

GEOG 457. Urban Geography and Planning. 3 Credits.
This course examines the internal workings of cities from political, economic, and social perspectives. Geographic approaches to urban analysis are discussed, as are various methods for contemporary urban planning. Students learn to view the city as a geographic phenomenon created by human effort. S.
The Harold Hamm School offers a master of arts (M.A.) and master of science (M.S.) in Geology, and a master of science (M.S.) in geological engineering.

Degrees Granted:
- Master of Arts (M.A.) in Geology
- Master of Science (M.S.) in Geology
- Master of Science (M.S.) in Geological Engineering
- Doctor of Philosophy (Ph.D.) in Geological Engineering

The Harold Hamm School also offers programs leading to combined Bachelor of Science (B.S.) and Master of Science (M.S.) degrees in either Geology or Geological Engineering.

As part of their graduate degree requirements, students will normally conduct research and write a thesis/dissertation. Research emphasis is currently in the following areas:
1. hydrogeology and environmental geology
2. economic geology of petroleum and coal
3. sedimentology, stratigraphy, and paleontology
4. glacial geology, geomorphology, and soils
5. petrology and geochemistry
6. geophysics and tectonics
7. water quality
8. engineering geology
9. numerical reservoir simulation, enhanced hydrocarbon recovery planning and economic valuation
10. interdisciplinary geological projects involving several research areas including integrated basin analysis, ecohydrology, climate change, carbon sequestration, remote sensing, and underground coal gasification.

Details about the Master of Science and Doctor of Philosophy in Geological Engineering, or about the combined B.S./M.S. degrees in Geological Engineering, can be found in the Engineering section of this catalog.

Information about the Geology degrees can be found below and by clicking on the links to the Degrees or Courses sections at the top of this page.

**Master of Arts (M.A.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.) in Geology**

*For M.S. and Ph.D. in Geological Engineering, please see separate listing in the Engineering section of this catalog.

**Mission Statement and Program Goals**

The Geology Graduate Programs provide instruction and research opportunities for graduate students in the geological sciences, maintain and develop geological research at UND, and serve the community, state, and region.

**Goal 1:** Graduate students will be able to communicate effectively in writing and through oral presentation.

**Goal 2:** Graduates of our program shall be employable in Earth science professions.

**Goal 3:** Graduate students shall be proficient in recently developed computational, laboratory, and field technology and instrumentation.

**Goal 4:** Graduate students shall be up-to-date concerning current trends in the geological sciences.

**Goal 5:** Graduate students shall have a broad knowledge of geology.

**Goal 6:** Graduate students shall do well in their coursework, demonstrating acquisition of knowledge and skills in the Earth sciences.

**Goal 7:** Graduate students shall have advanced and in-depth training in their chosen field.

**Goal 8:** The faculty who teach and advise geology graduate students shall be actively engaged in research and serve as excellent role models.
Master of Arts (M.A.) in Geology
Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. For admission to the geology M.A. program, applicants must hold a bachelor’s degree in geology from an accredited college or university or otherwise demonstrate sufficient coursework, training, or experience in geoscience.
2. Applicants may be admitted under “provisional” or “qualified” status, but to advance to “approved” status, they must have completed 5 to 6 credit hours of geology field course, or its equivalent, along with satisfactory achievement in supporting sciences and mathematics, as determined by the Harold Hamm School of Geology and Geological Engineering’s Graduate Admissions Committee.
3. Applicants must have a cumulative grade point average of 3.0 or higher.
4. Applicants are encouraged to submit their GRE score to support their application, especially if they do not have an undergraduate degree in geology.
5. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. For a Master of Arts degree, students must complete two or more semesters of calculus while an undergraduate or graduate student.

Students missing any of the above requirements may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate credit, within one year after beginning graduate work.

Initial decisions for admission and financial aid are made about March 1 for the fall semester and about September 1 for the spring semester.

To encourage undergraduate geology students to extend their studies to include a graduate degree, the College of Engineering and Mines has a combined program that permits students to earn both a bachelor’s (B.S.) and a master’s (M.A.) degree in geology. This program allows students to designate two three-credit graduate courses to count for both degrees. The selected courses must have graduate course standing and be designated when a student requests admission to the program.

Students may be admitted to the Combined Degree program if they have:

1. Completed 95 credit hours towards the bachelor’s degree.
2. Completed 30 credit hours of coursework and 8 credit hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Maintained an overall GPA of at least 3.0 in all geological sciences they took.
4. Completed an application to the UND School of Graduate Studies and been accepted for admission.

Once admitted to the Combined Degree Program, undergraduate students are eligible to take 500-level courses for graduate credit. Students must complete the petition titled, “Graduate Credit as an Undergraduate Student” prior to registering for the courses. Such courses could be included in the 30 credit hours for the degree and could appear in the program of study.

Students in the Combined Degree Program will be admitted to the School of Graduate Studies on completion of 125 credit hours for the bachelor’s degree.

The time normally needed to complete the Combined Degree Program is 1 year, plus an additional summer after admission to the Graduate School.

Degree Requirements

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as the following particular requirements set forth by the Harold Hamm School of Geology and Geological Engineering.

1. Students must complete a program of study that includes a minimum of 30 credit hours, including the credits granted for the thesis and the research leading to the thesis.
2. At least 15 credit hours must be for classes at or above the 500-level.
3. A maximum of 7 credit hours required for the degree may be transferred from another institution.
4. A minimum of 6 credit hours (undergraduate or graduate) must come from each subject area listed below:
   a. mineralogy, petrology, geochemistry
   b. sedimentology, stratigraphy, paleontology, geomorphology
   c. structural geology, geophysics, hydrogeology

5. Up to 12 credit hours of 300-400 level coursework in geology may be taken for graduate credit.

The time normally needed to complete the requirements for the master’s degree in geology is about two years of full-time work. Students with graduate teaching or research assistantships may need more time.

Master of Science (M.S.) in Geology
Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirement as published in the graduate catalog.

1. For admission to the geology M.S. program, applicants must hold a bachelor’s degree in geology from an accredited college or university or otherwise demonstrate sufficient coursework, training, or experience in geoscience.
2. Applicants may be admitted under “provisional” or “qualified” status, but to advance to “approved” status, they must have completed 5 to 6 credit hours of geology field course, or its equivalent, along with satisfactory achievement in supporting sciences and mathematics, as determined by the Harold Hamm School of Geology and Geological Engineering’s Graduate Admissions Committee.
3. Applicants must have a cumulative grade point average of 3.0 or higher.
4. Applicants are encouraged to submit their GRE score to support their application, especially if they do not have an undergraduate degree in geology.
5. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. For a Master of Science degree, students must complete 2 semesters of calculus, plus an additional calculus or relevant math, computer programming, or statistical class, while an undergraduate or graduate student.

Students missing any of the above requirements may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate credit, within one year after beginning graduate work.

Initial decisions for admission and financial aid are made about March 1 for the fall semester and about September 1 for the spring semester.

To encourage undergraduate geology students to extend their studies to include a graduate degree, the College of Engineering and Mines has a Combined Program that permits students to earn both a bachelor’s (B.S.) and a master’s (M.S.) degree in Geological Engineering. This program allows students to designate two three-credit graduate courses to count for both degrees: the selected courses must have graduate course standing and be designated when a student requests admission to the program.

Students may be admitted to the Combined Degree Program if they have:

1. Completed 95 credit hours towards the bachelor’s degree.
2. Completed 30 credit hours of coursework and 8 credit hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Maintained an overall GPA of at least 3.0 in all geological sciences they took.
4. Completed an application to the UND Graduate School and been accepted for admission.
Once admitted to the Combined Degree Program, undergraduate students are eligible to take 500-level courses for graduate credit. Students must complete the petition titled, "Graduate Credit as an Undergraduate Student" prior to registering for the courses. Such courses could be included in the 30 credit hours for the degree and could appear in the program of study.

Students in the Combined Degree Program will be admitted to the School of Graduate Studies on completion of 125 credit hours for the bachelor's degree.

The time normally needed to complete the Combined Degree Program is 1 year, plus an additional summer after admission to the Graduate School.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies, as well as the following particular requirements set forth by the Harold Hamm School of Geology and Geological Engineering:

1. Students must complete a program of study that includes a minimum of 30 credit hours, including the credits granted for the thesis and the research leading to the thesis.
2. At least 15 credit hours must be for classes at or above the 500-level.
3. A maximum of 7 of the credit hours required for the degree may be transferred from another institution.
4. A minimum of 6 credit hours (undergraduate or graduate) must come from each subject area listed below:
   a. Mineralogy, petrology, geochemistry
   b. Sedimentology, stratigraphy, paleontology, geomorphology
   c. Structural geology, geophysics, hydrogeology
5. Up to 12 credit hours of 300-400 level coursework in geology may be taken for graduate credit.

The time normally needed to complete the requirements for the master's degree in geology is about two years of full-time work. Students with graduate teaching or research assistantships may need more time.

Doctor of Philosophy (Ph.D.) in Geology

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. In addition:

1. To be admitted under "approved" status, the applicant must hold a Bachelor of Science degree in Geological Engineering from an ABET accredited or equivalent program. A bachelor’s degree in another engineering discipline or in a science field, qualifies a student to be admitted to "qualified status" with an obligation to acquire background undergraduate engineering and geology knowledge.
2. Applicants must submit a Graduate Record Examination General Test score if their B.S. degree is from a non-ABET accredited program. Other applicants are encouraged to submit GRE scores to support their application.
3. Applicants must have a cumulative Grade Point Average (GPA) of 3.0 or higher.
4. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

To encourage undergraduate geological engineering students to extend their studies to include a graduate degree, the College of Engineering and Mines has a Combined Program that permits students to earn both a bachelor’s (B.S.) and a master’s (M.S.) degree in Geological Engineering. This program allows students to designate two three-credit graduate courses to count for both degrees. The selected courses must have graduate course standing and be designated when a student requests admission to the program.

Students may be admitted to the Combined Degree Program if they have:

1. Completed 95 credit hours towards the bachelor’s degree.
2. Completed 30 credit hours of coursework and 8 credit hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Maintained an overall GPA of at least 3.0 in all geological sciences they took.
4. Completed an application to the UND Graduate School and been accepted for admission.

Once admitted to the Combined Degree Program, undergraduate students are eligible to take 500-level courses for graduate credit. Students must complete the petition titled, "Graduate Credit as an Undergraduate Student" prior to
registering for the courses. Such courses could be included in the 30 credit hours for the degree and could appear in the program of study.

Students in the Combined Degree Program will be admitted to the School of Graduate Studies on completion of 125 credit hours for the bachelor's degree.

The time normally needed to complete the Combined Degree Program is 1 year, plus an additional summer after admission to the Graduate School.

**Degree Requirements**

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Harold Hamm School of Geology and Geological Engineering.

### Thesis Option:

1. A minimum of 30 credit hours in a major field, including the credits granted for the thesis and the research leading to the thesis.

   - Geology/Geological Engineering coursework: 12
   - Other Engineering and Science coursework: 12
   - Thesis: 6

   **Total Credits:** 30

2. At least one-half of the credit hours must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the thesis.

### Non-Thesis Option (Independent Study):

1. Thirty-four (34) credit hours including credits required for the major.
   - Geology/Geological Engineering coursework: 15
   - Research Project/Independent Study: 3
   - Electives: 16

   **Total Credits:** 34

2. At least one-half of the credit hours must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Preparation of a written independent study approved by the faculty advisor.
5. Comprehensive final examination.

### Admission Requirements

1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or higher or a Master of Science degree in an engineering discipline with a GPA of 3.0.
2. Satisfy the Graduate School's English Language Proficiency requirements as published in the Graduate Catalog.
3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers Student’s Record of Publications, GRE test scores (for students who are applying with a B.S. engineering degree from an non-ABET accredited program), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.
4. A student holding a non-engineering degree or who does not meet the minimum requirements in items 1-2 above may apply to one of the Master of Science degree programs in the College of Engineering and Mines. Students successfully completing a UND M.S. engineering degree will be considered to satisfy the requirements of items 1-2 above; however, these students shall still be subject to the holistic evaluation process described in item 3 with the exception that new GRE test scores will not be required.
5. Students admitted to an engineering M.S.E.E. program but meeting the minimum requirements in items 1-2 above, may after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the master’s degree and work directly toward the Ph.D. degree. The recommendation of the advisory committee shall be brought to a vote by the program graduate committee relevant to the degree track requested by the student. A minimum of one week before such a meeting, the program graduate committee shall be notified and provided with the student’s updated file which shall consist of the materials used for application into the M.S.E.E. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered. If the recommendation is approved by the relevant graduate committee, the student will be given the qualifying exam. Passing this exam will advance the student to Approved Status in the Doctoral Program in Geological Engineering.

### Residence Requirements

The purpose of residence requirements is to provide an opportunity for a sustained and concentrated intellectual effort, to provide for immersion in an academic research environment, and to permit extensive interaction with fellow students and faculty of the Geological Engineering Department. Within the first two years of graduate work at UND, at least two consecutive semesters must be completed in residence. During residency, a student must be registered for at least nine credits in a semester, or be a graduate research or teaching assistant taking the appropriate credits to qualify as a full-time student. The remainder of the credits required for a degree can be completed in a manner to accommodate the student’s fiscal, family, job related, and other constraints with the consent of the student’s advisor. The program of study must be completed within the seven-year period normally allowed for graduate programs.

Under special circumstances, the student in conjunction with his/her advisory committee and the Geological Engineering Graduate Committee, can petition the Dean of the Graduate School for variances in this policy.

### Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Geological Engineering Doctoral Program.

The following requirements are in addition to the UND graduate school general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours of the GEOE 493-selected topics in geological engineering.
7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master's program).
8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. The qualifying examination includes the following three sections.

#### Section I

It will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of
the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

Section II

A detailed written doctoral research proposal must be submitted to the committee. The proposal should cover:

1. a literature review of the relevant field of research related to the project
2. proposed methods
3. preliminary results (simulation or experiment)
4. the objectives of the proposed project, and
5. tasks and the timeline of the proposed research in a Gantt chart.

The report should be reviewed and approved by the student advisor. Then, at least three weeks prior to the next step, the report should be distributed to the student committee members for their review and grading.

Each of the above (A-E) components will be evaluated and graded (0 to 20). To pass the written exam, student should earn a minimum of 16/20 in each category. All grades from student committee members will be averaged to determine a grade in each category.

If the report earns a passing grade a date can be scheduled for an oral presentation (i.e., Section III). If failed, student has the opportunity to revise and resubmit the report to the committee for re-evaluation.

Section III

An oral comprehensive examination should be presented to the committee on the research topics described in the above section (II-A to II-E). Three results for the oral exam can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam will be allowed one opportunity to repeat the exam in less than 6 months as specified by the student committee. Student who fails an exam a second time may request to be reclassified as a master's student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.

1. After successful completion of the written research proposal and oral presentation, an annual oral progress report should be presented to the committee. A part of these presentations will include details on the dissertation research progress and plan. Any deviation from the approved research objectives as stated and documented in the research proposal must be approved and justified by the committee.

2. A candidate for the degree must complete the original basic research investigation as documented in the research proposal. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a written dissertation covering the research. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be submitted for publication in refereed research journals. The candidate will submit the dissertation to the examining committee at least four weeks prior to defense date. The examining committee consists of the PhD committee and an external examiner from outside the University. The external examiner is selected by the department’s graduate committee from a list of three candidates proposed by the advisor. The external examiner should not have any current publication with the student's advisor or student and can be from academia or industry with a expertise relevant to the student's research. The student and advisor should not contact the external examiner directly before or after.

3. The candidate must present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements (http://und-public.coursesleaf.com/graduatestudies)). Four results of the examination can be obtained: 1) pass; 2) minor revision 3) major revision and 4) fail. For minor revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For major revisions the student is asked to fundamentally revise the methodologies and schedule another defense session. If failed, the student will not be able to obtain a PhD degree and may request to be reclassified as a master’s student and complete a Master of Science degree.

4. At least two peer reviewed ISI (Institute for Scientific Information) journals (as the first author) and two peer reviewed conference papers (as the first author) submitted with the consent of advisor.

GEOE Courses

GEOE 555. Advanced Rock Mechanics. 3 Credits.
Fundamentals of rock mechanics, elasticity theory of rock, failure criterion of rocks, laboratory and field testing methods, field instrumentation, the applications of rock mechanics in mining, tunneling and rock slopes engineering, and the applications of numerical methods in rock mechanics. Prerequisites: GEOE 323 and ENGR 203. F.

GEOE 591. Advanced Hydrocarbon Extraction in Engineering. 3 Credits.
This course describes technologies that can be applied to further recover underground energy resource - oil/gas, for example, that cannot be produced by primary or second extraction. Development of these processes requires significant technological advances in our understanding of underground mining from hydrocarbon reservoirs and may be the stimulus for future technological development.
Prerequisites: GEOE 301, MATH 166, MATH 266, CHEM 122, and CHEM 122L. F.

GEOE 599. Doctoral Research. 1-15 Credits.
Research contributing to the discovery and dissemination of knowledge and/or technology in Geological Engineering and contributing to the student's doctoral dissertation. Prerequisite: Admission to the PhD program in Geological Engineering. Repeatable to 15 credits. F, S, SS.

GEOE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOE 998. Thesis. 1-9 Credits.

GEOE 999. Dissertation. 1-18 Credits.
PhD student doctoral dissertation. Prerequisite: Admission to the PhD program in Geological Engineering. Repeatable to 18 credits. S/U grading, F, S, SS.

Undergraduate Courses for Graduate Credit

GEOE 323. Engineering Geology. 3 Credits.
This course is to introduce the application of geological, hydrological and environmental principles to geotechnical/geological engineering design, construction and operation as well as various geohazards. Prerequisites: One introductory geology course and MATH 165. S.

GEOE 417. Hydrogeology. 3 Credits.
Physical and chemical aspects of groundwater movement, supply, and contamination. Prerequisites: CHEM 121 or CHEM 221; MATH 166 or consent of instructor. F.

GEOE 418. Hydrogeological Methods. 2 Credits.
Field and laboratory methods used in hydrogeology; techniques of drilling, well and piezometer installation, determination of aquifer parameters, geophysical exploration, soil classification and analysis, ground water sampling and analysis. Includes field trip. Prerequisite: GEOE 417. F.

GEOE 419. Groundwater Monitoring and Remediation. 3 Credits.
Statistical methods for groundwater sampling and monitoring network design. Groundwater remediation and design; including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treatment. Prerequisites: MATH 166, GEOE 417 and a statistics course (ECON 210, PSYC 241, MATH 321 or MATH 353) or consent of instructor. S.

GEOE 425. Design Hydrology for Wetlands. 3 Credits.
Principles of chemistry, geology, hydraulics, and hydology applied to natural and constructed wetlands and other small catchments. Prerequisites: CHEM 121 and either CE 306/ME 306 or GEOE 417. S.

GEOE 427. Groundwater Modeling. 3 Credits.
Fundamentals of numerical modeling applied to groundwater flow. Spreadsheet calculations will be used to demonstrate the finite difference method applied to groundwater movement and storage. Simulation of practical groundwater problems will be performed with the U.S. Geological Survey’s MODFLOW code.
Prerequisites: GEOE 417 and MATH 265; some programming experience is recommended. On demand.
GEOE 455. Geomechanics II. 2 Credits.
The objective of this course is to train the students to use fundamental principles and field and lab techniques of Rock Mechanics to analyze real-world problems, identify the optimal methods, and solve the practical geological engineering problems with the combination of field and laboratory, analytical and experimental means. Emphasis will be on the fundamental principles and their application to practical engineering problems, both surface and underground. Prerequisites: GEOE 323 or consent of instructor. Prerequisite or Corequisite: GEOE 355. F.

GEOE 493. Selected Topics in Geological Engineering. 1-3 Credits.
Detailed study of selected topics in Geological Engineering. Includes laboratory if applicable. Repeatable. Repeatable. On demand.

GEOL Courses

GEOL 500. Sedimentary Geology. 1-4 Credits.
Selected topics in sedimentary geology, such as sedimentary processes, carbonate petrology, clastic petrology, and basin analysis. May be repeated up to 12 credits. Prerequisite: Consent of instructor. Repeatable to 12 credits. F.

GEOL 505. Isotope Geochemistry. 3 Credits.
Geochemistry and cosmochemistry of radioactive and stable isotopes; isotope equilibria; applications in paleoclimatology, environmental isotope geochemistry, igneous, metamorphic, and sedimentary petrology. Prerequisite: GEOL 321 or permission of instructor.

GEOL 506. Glacial Geology. 4 Credits.
Origin, growth, and movement of glaciers; landforms and deposits incident to glaciation. 3 hours lecture, 2 hours laboratory time per week. Prerequisite: GEOL 311.

GEOL 509. Advanced Mineralogy. 1-4 Credits.
Advanced study of specific mineral groups or selected topics in mineralogy. Prerequisite: GEOL 320; recommended prerequisite GEOL 321.

GEOL 511. Advanced Structural Geology. 4 Credits.
Reading and research in special topics in structural geology and geotectonics.

GEOL 512. Advanced Petrology. 1-4 Credits.
Selected topics in petrology taught using conventional lecture and laboratory/field approach. Prerequisite: GEOL 320.

GEOL 515. Advanced Paleontology. 3 Credits.
Selected topics include (but not limited to): Invertebrate paleontology; vertebrate paleontology; paleoecology; taxonomy; museum studies; western continental stratigraphy; critical boundaries. May be repeated. Prerequisites: GEOL 415, BIOL 150, or consent of instructor. Repeatable to 40 credits. On demand.

GEOL 518. Topics in Advanced Stratigraphy. 2-4 Credits.
Selected topics in lithostratigraphy and biostratigraphy. Prerequisites: GEOL 411, GEOL 415. Repeatable to 4 credits.

GEOL 520. Statistical Applications in Geology. 3 Credits.
The application of statistical techniques to geologic data and problems, with emphasis on analysis of geologic sequences, map analysis, and multivariate analysis of geologic data. Prerequisites: An introductory statistics course, such as CTL 515 or PSYC 241, and consent of instructor.

GEOL 522. History and Philosophy of Geology. 3 Credits.
Historical and philosophical development of the science of geology. Prerequisite: Permission of instructor.

GEOL 523. Topics in Advanced Geomorphology. 1-4 Credits.
Selected topics in geomorphic processes and landforms. Prerequisite: GEOL 311. Repeatable to 4 credits.

GEOL 525. Weathering and Soils. 3 Credits.
Properties and classification of soils; the factors and processes of weathering and soil formation. Prerequisite: GEOL 311 and GEOL 411, or consent of instructor.

GEOL 530. Topics in Physical Hydrogeology. 2 Credits.
Selected topics in groundwater, vadose-zone hydrology, fracture flow, analytical/numerical modeling, GIS and hydrology, and wetland soils/hydrology. Repeatable when topics vary. Prerequisite: Consent of instructor. Repeatable to 8 credits. F.S.

GEOL 531. Hydrogeochemistry. 3 Credits.
The origin, characteristics and modeling of surface and ground water geochemistry. Prerequisites: GEOL 321 and, MATH 166, or permission of instructor.

GEOL 532. Contaminant Hydrogeology. 3 Credits.
Chemical and physical processes affecting contaminant behavior in groundwater with analytical/numerical modeling and case studies. Prerequisites: GEOL 417 and GEOL 427 and MATH 265, or consent of instructor.

GEOL 540. Water Sampling and Analysis. 3 Credits.
Techniques of water and sediment sampling and analysis using equipment in the UND Water Quality Laboratory. Results are interpreted in the context of the natural systems from which the samples are taken. Enrollments are limited to eight students per section. A laboratory fee is required. Prerequisite: CHEM 121.

GEOL 551. Heat Flow. 3 Credits.
An exploration of Earth's thermal structure, thermal history and heat sources. The course begins with the theory of heat transfer within and through the surface of terrestrial planets. Methods of observation and modeling provide hands-on experience in field and laboratory activities. Applications of heat flow in tectonics, petrology, thermal maturity of kerogen, hydrogeology, geothemrics and climate change are presented with current examples. Prerequisite: Graduate standing. Corequisite: Permission of instructor. On demand.

GEOL 560. Geothermics I. 3 Credits.
A survey of the methods of geothermal exploration, assessment and production. The course covers the various methods for discovery and characterization of geothermal resources. Methods for assessment of energy in place and determination of recoverable energy are covered in depth. Current technologies for energy extraction and power production are presented with current examples. Prerequisite: Graduate standing. Corequisite: Permission of Instructor. On demand.

GEOL 561. Geothermics II. 3 Credits.
The course covers the historical development of geothermal policies, regulations and practices globally and in different states within the US. Matters of water usage, contamination and disposal are covered extensively. Current issues such as induced seismicity, hydrofracture, power plant size and location, electrical grid access and land use are critically examined. Prerequisite: Senior or Graduate Standing. Corequisite: Permission of Instructor. On demand.

GEOL 590. Research. 1-4 Credits.
Laboratory, field, or library research on problems of interest (may be repeated). Repeatable.

GEOL 591. Directed Studies. 1-4 Credits.
Directed advanced research in a specialized field of geologic study (may be repeated). Repeatable.

GEOL 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOL 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

GEOL 999. Dissertation. 2-12 Credits.
May be repeated up to 24 credits. Repeatable to 24 credits.

Undergraduate Courses for Graduate Credit

GEOL 311. Geomorphology. 4 Credits.
Dynamics of weathering, mass movement, running water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. Prerequisites: GEOL 101 or GEOE 203; MATH 165, PHYS 211, CHEM 121 or consent of instructor. F.

GEOL 320. Petrology. 3 Credits.
Description, classification and origin of igneous, metamorphic, and sedimentary rocks. Field and laboratory study of rocks. Engineering properties of earth materials. Advanced aspects of optical mineralogy. Includes laboratory. Prerequisite: GEOL 318. F.

GEOL 321. Geochemistry. 3 Credits.
Application of the principles of chemistry to geologic and hydrogeologic problems. Origin and distribution of the chemical elements. Introduction to radiochemistry, isotopic geochronology, and stable-isotope geochemistry. Prerequisites: GEOL 318, CHEM 122, and MATH 165 or consent of instructor. S.
GEOL 340. Digital Mapping Methods. 3 Credits.
This course integrates "hands-on" data acquisitions and map generation with an overview of the technology (GPS, lasers, and data management). Field projects focus on mapping methodology and laboratory projects focus on analysis and presentation. It is assumed that students have an undergraduate geology background and a basic knowledge of computer applications. Prerequisite: Junior Standing in geology.

GEOL 407. Petroleum Geology. 3 Credits.
Origin, accumulation and geologic occurrence of petroleum and gas. Prerequisites: GEOL 101 or GEOD 203, and GEOL 102. F, odd years.

GEOL 411. Sedimentology and Stratigraphy. 5 Credits.
Origin, transportation, deposition, and diagenesis of sediments; principles and applications of stratigraphy. Includes field trip and laboratory. Prerequisite: GEOL 320. S.

GEOL 414. Applied Geophysics. 3 Credits.
Principles of various geophysical methods and their application to geologic problems. Prerequisites: GEOL 101 or GEOD 203; MATH 165; and PHYS 211 or 251. F.

GEOL 415. Introduction to Paleontology. 4 Credits.
The principles of paleontology/paleobiology are presented using fossils to document the evolutionary, stratigraphic, and paleoecologic history of animal and plant life on Earth. Includes field trip and laboratory. Prerequisites: GEOL 102; BIOL 150 and BIOL 151 are recommended prerequisites. F, even years.

GEOL 422. Seminar II. 1 Credit.
Continuation of GEOL 421 experience. Preparation and delivery of oral presentations in science and engineering, culminating in oral presentation of senior thesis (GEOL 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. Prerequisites: GEOL 421, senior or graduate status in departmental major. F.S.

History
http://www.und.edu/dept/histdept/

FACULTY: Berger, Broedel (Graduate Program Director), Burin, Campbell, Caraher, Iseminger, Kelsch, Mochoruk, Porter, Prescott and Reese (Chair)

Degrees Granted: Master of Arts (M.A.), Master of Education (M.Ed.), Doctor of Arts (D.A.) and Doctor of Philosophy (Ph.D.)

The Department of History offers programs leading to the Master of Arts degree, the Master of Education degree, the Doctor of Arts degree, and the Ph.D. degree. The M.Ed. degree is also available for students who wish to complete an education degree with an area of concentration in History. See the M.Ed. requirements in the Degree Requirements (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements) section for further information. The program advisor for the M.Ed. will be in the Department of History, but students planning to take this option should also consult an advisor in the College of Education and Human Development.

Some Teaching Assistantships, providing stipends and waivers of tuition, are available. Applications for assistantships should be submitted by March 1, but later applications will be considered. M.A. students are eligible for four semesters of assistantships and doctoral students are eligible for six semesters of assistantships.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Arts (M.A.)

Mission Statement and Program Goals

The mission of the Graduate Program of the History Department of the University of North Dakota is to provide quality graduate-level instruction and supervision in the major fields of Great Plains History, Rural History, North American, and Western European History and in the Minor Fields of Public History and World History. Successful students will be prepared to seek careers as college and university history teachers, as public historians, museum curators and archivists, or in a variety of other professions (journalism, business, government service) which require well-developed skills in research, critical thinking, and oral and written expression.

Goal 1: Students will be able to conduct significant, independent research in their chosen field of concentration.

Goal 2: Students will demonstrate considerable knowledge of disciplinary sub-fields, major interpretive schools of thought, appropriate methodological approaches, and a mastery of the major works in their field of concentration.

Goal 3: Students will be able to combine the results of their primary research with their knowledge of the pertinent secondary and theoretical literature and present their findings both orally and in writing.

Doctor of Arts (D.A.)

Mission Statement and Program Goals

The mission of UND’s Doctor of Arts program is to provide candidates the opportunity to earn a terminal degree in history that is both rich in content and which will allow them to develop a unique blend of teaching and research skills. The D.A. program is specifically designed to prepare those teachers/scholars whose primary interest revolves around teaching history at the undergraduate level, most particularly at two- and four-year institutions, although the degree also provides opportunities for students to engage in public history of various types. Because the current academic marketplace requires instructors who can teach in multiple fields in a manner informed by the best pedagogical practices, the D.A. degree places heavy emphasis upon mastering a broad range of subject matter (and the attendant methodologies and historiographies) and training in pedagogy, both through coursework and supervised internships. Degree candidates will develop an appropriate level of mastery of materials in four of the following areas of history: Modern European from 1750; Pre-modern European/Mediterranean to 1750; U.S. to 1877; U.S. from 1877; World; a mastery they will document through rigorous examinations. Finally, candidates will also complete a substantial research project within the field of their primary concentration. This work, the capstone to the student’s UND experience, will integrate the lessons of the classroom, the training in various historical methodologies, and field research work. Ideally, these projects will be suitable for publication and/or public presentation.

Goal 1: Students will be able to teach a broad range of history courses, including United States History, European History, and World History on the undergraduate level.

Goal 2: Students will be able to conduct significant, independent research in their chosen field of concentration.

Goal 3: Students will demonstrate a broad knowledge of disciplinary subfields, major interpretive schools of thought, appropriate methodological approaches and a mastery of the major works in their field of concentration.

Goal 4: Students will be able to integrate and organize their primary research with their knowledge of historiography, methodology, and the pertinent theoretical literature in order to meet specific pedagogical and educational goals.

The Doctor of Arts program has been designated a Western Regional Graduate Program by the Western Interstate Commission on Higher Education (WICHE) because of its uniqueness and strength. It is, therefore, open to residents of the thirteen western states at resident tuition rates.

Doctor of Philosophy (Ph.D.)

Combined Ph.D. Program with NDSU

Mission Statement and Program Goals

The mission of the Graduate Program of the History Department of the University of North Dakota is to provide quality graduate-level instruction and supervision in the major fields of Great Plains History, Rural History, North American, and Western European History and in the Minor Fields of Public History and World History. Successful students will be prepared to seek careers as college and university history teachers, as public historians, museum curators and archivists, or in a variety of other professions (journalism,
business, government service), which require well-developed skills in research, critical thinking, and oral and written expression.

**Goal 1:** Students will be able to teach college and university-level courses in fields including Great Plains History, Rural History, North American History, Western European History, Public History and World History.

**Goal 2:** Students will be able to conduct significant, independent research in their chosen field of concentration.

**Goal 3:** Students will demonstrate a broad knowledge of disciplinary sub-fields, major interpretive schools of thought, appropriate methodological approaches, and a mastery of the major works in their field of concentration.

**Goal 4:** Students will be able to combine the results of their primary research with their knowledge of the pertinent secondary and theoretical literature and present their findings both orally and in writing and in their teaching.

**Master of Arts (M.A.)**

**Admission Requirements**

The applicant must meet the Graduate School’s current minimum general admission requirements as published in the graduate catalog.

1. Demonstration of preparation for graduate study in history. This includes one of the following from a recognized college or university:
   a. A bachelor’s degree in history, or
   b. An undergraduate degree with a minimum of 20 semester credits in history with at least 6 credits at the upper division level, or
   c. An undergraduate degree or combination of classes clearly demonstrating the applicant’s ability to pursue graduate study in history.
2. An overall undergraduate GPA of at least 3.00 and at least 3.25 in all undergraduate history courses.
3. A writing sample, preferably a research or seminar paper, that demonstrates the applicant’s research, analytical and writing skills.
4. Three letters of recommendation with at least two coming from individuals who hold or have held academic positions and who can comment on the applicant’s aptitude for graduate work.
5. A one-to-two page statement that explains the applicant’s interest in history, the reason for applying to the UND graduate program, and the area or areas in which the applicant intends to take courses and conduct research.
6. The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.
7. To insure full consideration of applications, especially for tuition waivers and graduate teaching assistantships, the application deadline for Fall admission is March 15 and for Spring admission, it is September 30. Later applications will be considered.

**Degree Requirements**

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements of the School of Graduate Studies as well as requirements of the History Department.

**Thesis Option**

1. The M.A. degree (thesis option) requires a minimum of 30 credit hours.
2. In consultation with a designated advisor, the student will select a supervisory committee and prepare a program of study that provides the student with the academic tools necessary for advanced scholarly research, responds to the student’s academic and professional interests and goals, and fulfills all degree requirements. At the discretion of the student’s advisor, this program may require demonstrable proficiency in a foreign language, and may include a minor or cognate.
3. The following coursework is required:
   - HIST 501 Methods of Historical Research 3
   - HIST 502 Historiography 3
   - HIST 511 Research Seminar in American History 6
   - HIST 513 Research Seminar in World History 6
   - Electives 9
   - HIST 998 Thesis 6
   Total Credits 30

4. The candidate will successfully complete, defend and submit to the School of Graduate Studies a thesis that meets the History Department’s established guidelines.

**Non-Thesis Option**

1. The M.A. degree (non-thesis option) requires a total of 35 credit hours.
2. In consultation with a designated advisor, the student will select a supervisory committee and prepare a program of study that provides the student with the academic tools necessary for advanced scholarly research, responds to the student’s academic and professional interests and goals, and fulfills all degree requirements. At the discretion of the student’s advisor, this program may require demonstrable proficiency in a foreign language, and may include a minor or cognate.
3. The following coursework is required:
   - HIST 501 Methods of Historical Research 3
   - HIST 502 Historiography 3
   - HIST 511 Research Seminar in American History 6
   - HIST 513 Research Seminar in World History 6
   - HIST 515 Research Seminar in European History 6
   - Electives 15
   - HIST 997 Independent Study (see #4 below) 2
   Total Credits 35

   * With the approval of the student’s advisor, up to twelve of these credits may be taken within the minor or cognate.

4. The candidate will successfully complete a scholarly independent investigation of a topic chosen in consultation with the advisor and members of the supervisory committee.
5. The candidate will successfully complete a comprehensive written examination administered by the advisor and supervisory committee, responding to the student’s program of study.

**Doctor of Arts (D.A.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. All M.A. admission requirements.
2. A master’s degree, preferably in history and with thesis, but at least 15 semester credits of history at the graduate level.
3. A GPA of at least 3.50 for the master’s level work.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Preference will be given to applicants with teaching experience, especially in the fields of history, the social sciences, or the humanities.
6. To insure full consideration of applications, especially for tuition waivers and graduate teaching assistantships, the application deadline for Fall admission is March 15 and for Spring admission it is September 30. Later applications will be considered.
Degree Requirements

Students seeking the Doctor of Arts degree at the University of North Dakota must satisfy all general requirements of the School of Graduate Studies as well as specific requirements of the History Department.

1. Completion of 90 semester credits beyond the baccalaureate degree, including acceptable master’s work.

2. The following coursework:

- HIST 501 Methods of Historical Research 3
- HIST 502 Historiography 3
- HIST 551 Seminar in the Teaching of History 3

Select one of the following (research seminar):

- HIST 511 Research Seminar in American History 3
- HIST 513 Research Seminar in World History 3
- HIST 515 Research Seminar in European History 3

Select two of the following (reading courses):

- HIST 592 Readings in World History 3
- HIST 593 Readings in American History 3
- HIST 594 Readings in European History 3

Total Credits 18

3. An area of concentration in one of the following fields: U.S. History to 1877, U.S. History since 1877, Pre-Modern European/Mediterranean History to 1750, Modern European History, World History. The concentration will include:
   a. 12 elective graduate credits in the field of concentration.
   b. HIST 595 Research (12 credits). An independent research project exploring a topic of significant concern to historians and teachers of history.

4. The following coursework:

   - T&L 539 College Teaching 3

Select one of the following:

   - PSYC 501 Psychological Foundations Educ 3
   - T&L 544 Assessment in Higher Education 3
   - T&L 545 Adult Learners 3
   - T&L 547 Technology in Higher Education 3

Total Credits 6

5. HIST 599 Internship in the Teaching of History (9 credits): Students will generally assist and co-teach a 100 level survey course with an experienced faculty mentor in the first semester of the internship; in two following semesters the student will teach two of the following independently:

   - HIST 101 Western Civilization I 3
   - HIST 102 Western Civilization II 3
   - HIST 103 United States to 1877 3
   - HIST 104 United States since 1877 3
   - HIST 105 World Civilizations I 3
   - HIST 106 World Civilizations II 3

6. Written examinations in both United States fields and in two of the three European fields selected on the basis of work done in a Master’s degree program as well as the doctoral program. (Exams may be taken after 60 hours of the program of study have been completed.)

Doctor of Philosophy (Ph.D.)

Combined Ph.D. Program with NDSU

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Preference for admission into the Ph.D. program with full graduate standing will be given to applicants who have a GPA of at least 3.5 in history courses in an earned bachelor’s or master’s degree.

2. Applicants will submit a statement of intent clearly outlining the applicant’s research interests, career goals, and purpose for seeking a Ph.D. in history.

3. Applicants will submit a substantial paper previously submitted for a class in history to provide evidence of ability to research thoroughly, to interpret and analyze primary and secondary sources, to synthesize information, to organize thoughts logically, and to communicate clearly and effectively.

4. Scores on the Graduate Record Examination are required.

5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements of the School of Graduate Studies as well as specific requirements of the History Department.

1. Students must satisfactorily complete 90 credits beyond the bachelor’s degree. Students entering with an M.A. degree must complete at least 60 additional semester graduate credits. Core course requirements must be met which include: Methods of Historical Research, Historiography, Seminar in the Teaching of History, at least two research seminars, and at least two readings courses. Students must complete 36 course credits with at least 27 credits in history courses. Students will earn 12 credits in two or more major fields. Students may choose a third major field or a minor field (nine semester credits).

2. Students must have a proficiency in two languages other than their native language or one foreign language and one special research skill such as statistics or computer science.

3. The program will require at least one academic year in residence at either campus. Each student will register at one of the universities that will be the student’s academic “home.” The student’s advisor must be employed in the home university. At least one member of the student’s committee must be employed at the other (not home) university. Students may have to take courses at both universities.

4. Students will write three comprehensive examinations in their major and minor fields. The exams will be read and graded by the supervisory committee. Students will complete an oral examination based on the written exams. The oral examination is to be conducted by the supervisory committee.

5. Students will write a dissertation (up to 24 credits) on an approved topic in consultation with the faculty adviser and the supervisory committee of five faculty. The dissertation must be based on extensive research in primary and secondary sources, must argue an original thesis, and must be defended before the supervisory committee.

6. The committee will be composed of the faculty adviser who represents the student’s field of study and who will direct the research and writing of the dissertation. A second member of the committee (second reader) represents the student’s major field of study. A third member of the committee will represent the student’s minor field of study. The fourth member of the committee represents either the student’s major field or minor field. At least one of the four history faculty must be from the cooperating (non-home) university. The School of Graduate Studies will appoint the fifth member of the committee.

Residency Requirements

1. Students enrolled in the Ph.D. program are required to complete at least one academic year (18 credits minimum) in residence at one campus.

2. Resident students may qualify for teaching assistantships. Students who have completed a M.A. degree may be assigned full responsibility for undergraduate courses or may be assigned to assist a faculty member in teaching courses.

3. Students will be required to take some courses from faculty at both campuses, but will register at only one university. Some courses will be offered by interactive video network, some will be offered through internet online systems, some courses will require students to travel to the other campus.

4. Students not residing on one of the cooperating campuses will have to have access to a satisfactory research library for various courses and for dissertation research.
Courses

‡ All 593 and 594 courses involve reading, bibliographical study, discussion, and writing. Study may be confined to a subtopic within the general subject area. Repeatable with different subtopics. Students in the M.A. program will not ordinarily take more than one 593 or 594 in the primary concentration.

The following undergraduate courses are eligible for inclusion on graduate programs of study. Additional assignments and higher standards of accomplishment are required of students taking these courses for graduate credit.

**HIST 344** Ancient Rome 3
**HIST 405** The United States: Age of Jefferson and Jackson, 1789-1850 3
**HIST 406** The United States: Civil War and Reconstruction, 1850-1877 3
**HIST 407** The United States: Rise of Industrial America, 1877-1917 3
**HIST 408** The United States, 1920-1945 3
**HIST 412** U.S. Foreign Relations since 1900 3
**HIST 413** The United States since 1945 3
**HIST 419** Great Britain since 1815 3
**HIST 431** Seminar in the History of the Great Plains 3
**HIST 460** The Atlantic World 3
**HIST 470** United States-Canadian Relations, 1776 to the Present 3
**HIST 480** Introduction to Public History 3
**HIST 481** Public History Practice 3

**Major Fields**
Great Plains History
Rural History
North American History
Western European History

**Minor Fields**
Public History
World History

**Libraries**
The combined UND/NDSU libraries contain over two million volumes. In addition, each university library houses an archive of historic materials that has supported the research of many faculty members and visiting scholars.

The catalogs of the Chester Fritz Library and the Elwyn B. Robinson Department of Special Collections at the University of North Dakota are available online.

The catalog of the Libraries at North Dakota State University is available online along with the catalog of the Institute for Regional Studies.

The North Dakota State University Library also houses the Germans From Russia Heritage Collection.

**Locations**
The University of North Dakota is in Grand Forks and North Dakota State University is in Fargo. Both cities are situated along Interstate 29 about 75 miles apart.

Courses

**HIST 501. Methods of Historical Research. 3 Credits.**
This course is intended to teach graduate students to comprehend, analyze, apply, and evaluate the basic techniques and frameworks for historical research. These include basic historical theories, methods, and problems (such as causality, objectivity, types of evidence, schools of historical thought, evaluation of sources, qualitative and quantitative analysis). Students will also learn how to use standard databases and bibliographical aids to find, identify, and assess appropriate information to support, modify, or reject historical interpretations and arguments. Prerequisite: Graduate status.

**HIST 502. Historiography. 3 Credits.**
Required for all candidates for advanced degrees in history. An introduction to the history of historical thought, from the classical Greeks to the present, with examination of some of the works of important historians writing in the western tradition. The first half of the course is primarily devoted to classical and European historians; the second half is primarily devoted to modern and American historians.

**HIST 503. Advanced Historical Methods. 3 Credits.**
This course introduces students to a specific historical research methodology through instruction and practice. Repeatable up to 6 credits. Repeatable to 6 credits.

**HIST 511. Research Seminar in American History. 3 Credits.**
Required for all candidates for the Doctor of Philosophy, Doctor of Arts, and Master of Arts who do not take History 515. This course requires preparation of a research paper. The subject of the research will be within an announced general topic area of American History. Repeatable. Repeatable.

**HIST 513. Research Seminar in World History. 3 Credits.**
This course introduces students to the research and writing of World History with a stress on the proper utilization of comparative and thematic methodology. It requires the preparation of a research paper that utilizes the methodology of World History.

**HIST 515. Research Seminar in European History. 3 Credits.**
Required for all candidates for the Doctor of Philosophy, Doctor of Arts, and Master of Arts who do not take History 511. This course requires preparation of a research paper. The subject of the research will be within an announced general topic area of European History. Repeatable. Repeatable.

**HIST 520. Material Culture. 3 Credits.**
This course introduces students to a material culture research methodology through reading, discussion, research, and writing.

**HIST 521. Public History. 3 Credits.**
This course exposes students to the practice of public history through readings, discussion and practice. Repeatable to six credits. Repeatable to 6 credits.

**HIST 551. Seminar in the Teaching of History. 3 Credits.**
Required of all students pursuing the Doctor of Philosophy and Doctor of Arts. Includes methods appropriate to college-level teaching. Class consists of discussion, demonstration, and practice. S.

**HIST 585. Directed Readings. 3 Credits.**
Independent, directed readings on a topic tailored to the individual needs of the student. Graduate students may repeat this course to a maximum of 6 credits; Masters students may not repeat the course. Prerequisite: Graduate status.

**HIST 592. Readings in World History. 3 Credits.**
This course focuses upon the reading and understanding of World History historiography, theories and methods through thematic and comparative readings. Repeatable. Repeatable.

**HIST 593. Readings in American History. 2-3 Credits.**
Topics vary. Involves reading, bibliographical study, discussion, and writing. Study may be confined to a subtopic within the general subject area. Repeatable with different subtopics. Students in the M.A. program with a U.S. primary concentration will not ordinarily take more than one 593. Repeatable to 30 credits.

**HIST 594. Readings in European History. 2-3 Credits.**
Topics vary. Involves reading, bibliographical study, discussion, and writing. Study may be confined to a subtopic within the general subject area. Repeatable with different subtopics. Students in the M.A. program with a European primary concentration will not ordinarily take more than one 594. Repeatable to 36 credits.
HIST 595. Research. 1-6 Credits.
Requires a research project that will be a component of the area of concentration. Repeatable to 12 credits. Prerequisite: Candidates for the Doctor of Arts only. Repeatable to 12 credits.

HIST 599. Internship in the Teaching of History. 3 Credits.
The internship requires the teaching of three courses to demonstrate proficiency in college-level teaching at the undergraduate level. Although the teaching is supervised, the student has full responsibility for the courses. The internship may be conducted on this campus or, with proper arrangement and supervision, on another campus. May be repeated to a maximum of nine credits. Prerequisite: Candidates for the Doctor of Arts only. Repeatable to 9 credits. S, odd years.

HIST 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

HIST 997. Independent Study. 2 Credits.
Repeatable to 6 credits.

HIST 998. Thesis. 1-6 Credits.
Repeatable to 24 credits.

HIST 999. Dissertation. 3-24 Credits.
Repeatable to 24 credits.

Undergraduate Courses for Graduate Credit

HIST 344. Ancient Rome. 3 Credits.
A survey of the prehistory, historical development, and ultimate decline in Rome. In addition to inquiries into the military, political, cultural, economic, and religious experiences of the ancient Romans, this course will attempt to delineate those qualities of life that were peculiarly Roman. S, even years.

HIST 405. The United States: Age of Jefferson and Jackson, 1789-1850. 3 Credits.
A study of the creation of a new, expansive nationalism in the development of new institutions and new national character, and the simultaneous growth of sectional forces which brought the new nation to the brink of Civil War. F, even years.

HIST 406. The United States: Civil War and Reconstruction, 1850-1877. 3 Credits.
A study of the acceleration of the forces of sectionalism and racism that caused the temporary breakdown of the American democratic process and the tragedy of Civil War and Reconstruction. S, odd years.

HIST 407. The United States: Rise of Industrial America, 1877-1917. 3 Credits.
A survey of the rise of America to industrial and world power. Emphasis is placed upon the great changes which the Industrial Revolution brought and the American response to these changes. Detailed attention is given to the Populist and Progressive movements. F, odd years.

HIST 408. The United States, 1920-1945. 3 Credits.
A study of American society from the end of World War I through World War II. Emphasis will be placed upon the Republican ascendancy and social changes during the 1920s, the causes of the Great Depression, the New Deal, the road to World War II, and the war, especially the homefront. F, odd years.

HIST 412. U.S. Foreign Relations since 1900. 3 Credits.
An advanced survey of the major policies advocated and pursued by the U.S. during the 20th century. S, odd years.

HIST 413. The United States since 1945. 3 Credits.
An advanced examination of the United States as it has developed from the height of its power, influence, and prosperity through years of upheaval, cultural and political transformation, and economic decline. F, even years.

HIST 419. Great Britain since 1815. 3 Credits.
A survey of British history since 1815 with an emphasis on the state of mind known as "Victorian," as it was manifested, practiced, or criticized in the nineteenth century; its influence on economics, politics, foreign affairs, and social policy; and its vestiges in modern-day Britain. F, even years.

HIST 431. Seminar in the History of the Great Plains. 3 Credits.
This course promotes focused study of the Great Plains of North America through reading, discussion, research, and writing. Students will examine all aspects of Great Plains history including culture, environment, social organization, economics, and politics from the ancient past to the present. S, odd years.

HIST 460. The Atlantic World. 3 Credits.
This is a comparative world history course that focuses upon the cultural, economic, social, political, ideological and religious interaction, competition, conflict and change between Western Europe, West Africa, and the Americas. The course will begin in the 1400s by examining the foundations of European expansion and end with the revolutions of the Americas and Europe in the late 18th and early 19th centuries. A major focus of the class will be cultural interaction, the slave trade, and the foundations of the modern world system. F, odd years.

HIST 470. United States-Canadian Relations, 1776 to the Present. 3 Credits.
This course explores the historical relationships linking and dividing Canada and the United States of America since 1774. Because of the unique constitutional and diplomatic status of British North America and then Canada itself, this course examines the often complex tri-partite relationship between the U.S., Canada, and Great Britain. F, even years.

HIST 480. Introduction to Public History. 3 Credits.
An introduction to public history at federal, state, and local levels. Emphasis is given to archival theory, oral history, museum studies and historic preservation, with attention to awareness of historical resources. On demand.

HIST 481. Public History Practice. 3 Credits.
A practicum in which the student learns through experience the techniques of public history work. S, odd years.

Kinesiology and Public Health Education

http://education.und.edu/kinesiology-and-public-health-education/index.cfm

Pearson (Chair), Fitzgerald, Rhoades, Sabato, M. Short, S. Short (Graduate Director), Tomkinson, Walsh, and Whitehead

Degree Granted: Master of Science (M.S.)
The Department of Kinesiology and Public Health Education offers individualized programs of study that lead to the Master of Science (thesis or non-thesis option) with a major in Kinesiology. The program provides students with opportunities to study the scientific foundations of kinesiology as well as several of its professional applications. Faculty and students work together to develop programs of study to meet the M.S. degree requirements (see below), to assist with students’ academic and professional goals, and to contribute to the Department mission.

Master of Science (M.S.)
Details pertaining to admission requirements, degree requirements, and courses offered can be found in the Degree section.

Mission Statement
Recognizing that the health and wellness of the population depends largely on the lifestyles of its citizens, the Department of Kinesiology and Public Health Education (KPHE) strives to play a key role in educating about and promoting lifestyle behaviors (e.g., physical activity and sport) and environmental factors (e.g., advocacy) that facilitate comprehensive health and wellness, and in minimizing modifiable risk behaviors and factors (e.g., tobacco use, alcohol abuse) that may adversely impact health and wellness. With a vision of improving health and wellness across the lifespan, locally and afar, the department goals include

• Preparing future leaders for careers in the health professions, including educational, laboratory, clinical, community, and exercise and sport settings;
• Providing educational opportunities to the University of North Dakota community to learn and apply both knowledge and decision-making skills which relate to healthy lifestyles;
• Engaging in and sharing, through collaborative scholarship, the discovery of new knowledge and applied methods that enable individuals and communities to live healthier lives; and
• Offering expertise and service to both the local and broader community and profession.
Graduates have the opportunity to pursue careers in physical education teaching, public health education, fitness and wellness education, leadership and management, athletic coaching, or to continue their education in graduate or professional studies (See Kinesiology, Master's Program).

**Master of Science (M.S.)**

**Admission Requirements**

Applicants who are seeking admission to the School of Graduate Studies must meet all of the minimum general School of Graduate Studies admission requirements identified in the graduate catalog. In addition, the prospective students must fulfill the requirements for admission to the graduate program in Kinesiology.

1. A four-year bachelor’s degree from a recognized college or university.
2. A minimum of 20 semester credits of undergraduate academic coursework in kinesiology and related areas. The following undergraduate courses (or equivalents) are required:
   - KIN 404 Adapted Physical Activity 3
   - KIN 402 Exercise Physiology 3
   - KIN 332 Biomechanics 3
   - KIN 276 Motor Learning 2-3
   - KIN 355 Applied Motor Development 3
   - KIN 440 Sport Psychology 3
   - KIN 401 Sport Sociology 3

4. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. Students who have received a bachelor’s degree or higher from the United States, or countries where English is the native language, e.g., Australia, New Zealand, England, Canada, are not required to submit the TOEFL.
7. A personal statement of academic and professional goals, which will be used to evaluate the potential for success in the graduate program and the adequacy and appropriateness of undergraduate/professional preparation.
8. Satisfactory scores on the Graduate Record Examination (General Test).

Note: An applicant without satisfactory undergraduate preparation may be admitted to the program, but will be required to remove deficiencies by completing the necessary undergraduate courses without receiving graduate credit for them.

**Degree Requirements**

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Kinesiology Graduate Program.

**Thesis Option:**

1. A major of at least 30 credits.
2. Completion of:
   - KIN 501 Introduction to Research in Kinesiology 4
   - KIN 526 Introduction to Kinesiology Statistics 3
   - KIN 561 Critical Synthesis and Analysis in Kinesiology 2
   - KIN 997 Independent Study 2

4. At least one-half of the credits must be at or above the 500-level.
5. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
6. Establish the Faculty Advisory Committee and submit the Program of Study by the completion of nine graduate credits.

**Non-Thesis Option:**

1. A major of at least 32 credits.

2. Completion of:
   - KIN 501 Introduction to Research in Kinesiology 4
   - KIN 526 Introduction to Kinesiology Statistics 3
   - KIN 561 Critical Synthesis and Analysis in Kinesiology 2
   - KIN 997 Independent Study 2

3. A research-based study of the psychological aspects that are associated with participation in exercise/physical activity. Prerequisite: KIN 440 or consent of instructor.

**Courses**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>KIN 501</td>
<td>Introduction to Research in Kinesiology</td>
<td>4</td>
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<tr>
<td>KIN 526</td>
<td>Introduction to Kinesiology Statistics</td>
<td>3</td>
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<tr>
<td>KIN 561</td>
<td>Critical Synthesis and Analysis in Kinesiology</td>
<td>2</td>
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<tr>
<td>KIN 997</td>
<td>Independent Study</td>
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<td>KIN 502</td>
<td>Evaluation in Kinesiology</td>
<td>3</td>
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<td>KIN 511</td>
<td>Theory and Practice in Administration</td>
<td>2</td>
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<tr>
<td>KIN 512</td>
<td>Theory and Practice in Sports Administration</td>
<td>2</td>
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<td>KIN 513</td>
<td>Supervision of Teaching and Coaching in Sports</td>
<td>3</td>
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<td>KIN 514</td>
<td>Theory and Practice in Intramural Sports</td>
<td>2</td>
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<tr>
<td>KIN 520</td>
<td>Curriculum Development for Physical Education</td>
<td>3</td>
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<tr>
<td>KIN 521</td>
<td>Analysis of Teaching and Coaching</td>
<td>3</td>
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<tr>
<td>KIN 522</td>
<td>Historical and Philosophical Foundations</td>
<td>2</td>
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<td>KIN 523</td>
<td>Adapted Activities</td>
<td>3</td>
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<td>KIN 524</td>
<td>Motor Development</td>
<td>3</td>
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<tr>
<td>KIN 525</td>
<td>Introduction to Kinesiology Statistics</td>
<td>3</td>
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</tbody>
</table>

Courses for graduate students in the Kinesiology program cover a wide range of topics, from research methodology to practical applications in physical education and coaching. The program is designed to prepare students for careers in the field of kinesiology, whether in research, teaching, or administration.
KIN 530. Sports Biomechanics. 4 Credits.
The application of principles of mechanics to the study of human motion.
Prerequisite: KIN 332 or consent of instructor.

KIN 531. Sport Psychology. 3 Credits.
A research-based study of the psychological aspects associated with participation in sport.
Prerequisite: KIN 440 or consent of instructor.

KIN 532. Exercise Physiology Laboratory Techniques. 3 Credits.
This course provides an overview of laboratory and field measurements common to exercise physiology.
The course focuses on the use of these measurements for conducting physical fitness and wellness assessments and
exercise physiology related research. Prerequisite: KIN 402.

KIN 533. Motor Learning and Control. 3 Credits.
Study of the acquisition and control of human motor skill.
Prerequisite: KIN 276 or equivalent or consent of instructor.

KIN 534. Sport Sociology. 3 Credits.
This course is designed to examine various sociological factors in American society and their relationship to the sport experience.
Prerequisite: KIN 401 or consent of instructor.

KIN 535. Advanced Exercise Physiology I. 3 Credits.
The focus of this course is on the mechanisms which affect the cardiovascular and pulmonary system responses at rest, during and after exercise.
Prerequisites: KIN 402 or equivalent and consent of instructor.

KIN 536. Advanced Exercise Physiology II. 3 Credits.
Acute and chronic muscle function, energy metabolism, and regulatory process of skeletal muscle and muscle cell function during rest, during exercise and
during recovery will be the focus of this lecture course. Prerequisites: KIN 402 or equivalent, and consent of instructor.

KIN 537. Applied Sport Psychology. 3 Credits.
A study of psychological skill training programs for use with team and individual sports athletes.
Prerequisite: KIN 440 or consent of instructor.

KIN 538. Exercise in Health and Disease. 3 Credits.
The role of exercise in the prevention and rehabilitation of individuals in various disease states (e.g., atherosclerosis, chronic obstructive lung disease, hypertension, diabetes, osteoporosis, obesity, and others) and health states (e.g., aging and pregnancy).
This is a lecture course. Prerequisite: KIN 535 or consent of the instructor.

KIN 539. Theory and Practice of Exercise Testing. 3 Credits.
The focus of this lecture course is on the electrophysiology of myocardial function and exercise prescription for symptomatic and asymptomatic populations.
Students will learn to interpret resting and exercise electrocardiogram recordings.
Prerequisite: Consent of instructor.

KIN 540. Teaching Lifetime Fitness. 3 Credits.
A study of the philosophical, disciplinary, and professional considerations that are necessary for the optimal planning and execution of lifetime fitness/
wellness education programs in public schools and allied settings.

KIN 541. Adult Fitness Programming. 3 Credits.
A study of adult fitness and wellness programs in different settings and for a variety of adult subpopulations and special groups.

KIN 555. Special Topics in Kinesiology. 1-4 Credits.
Investigation of special topics in the study of kinesiology not included in current
departmental course offerings. Repeatable when topics differ. Repeatable.

KIN 560. Seminar in Kinesiology. 1 Credit.
Presentations of current topics based on reviews of literature. Repeatable to 4 credits.
Prerequisite: Consent of instructor. Repeatable to 4 credits. S/U grading.

KIN 561. Critical Synthesis and Analysis in Kinesiology. 2 Credits.
This course is designed to provide the student with the opportunity to critically
analyze and synthesize selected topics in kinesiology.
Prerequisite: 20 hours of graduate credit.

KIN 585. Internship in Kinesiology. 3-6 Credits.
Professional experience and skill development through supervised placement at an approved work site (or other program) relevant to the course of study.
Repeatable to 6 credits. Prerequisites: Appropriate foundational and major area coursework and consent of advisor and on-site supervisor. Repeatable to 6 credits.

KIN 590. Individual Research in Kinesiology. 1-4 Credits.
Library, laboratory or field research of an approved project in Kinesiology.
Repeatable to 4 credits. Prerequisites: KIN 501 and consent of the student's faculty advisor. Repeatable to 4 credits.

KIN 592. Directed Readings in Kinesiology. 2-3 Credits.
Extensive readings to cover a student's area of specialization and interest;
written reports are required (may be repeated to a total of six credits).
Prerequisites: KIN 501 and consent of the student's faculty advisor. Repeatable to 6 credits.

KIN 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

KIN 997. Independent Study. 2 Credits.

KIN 998. Thesis. 1-9 Credits.
Minimum of 4 credits for thesis option. Repeatable to 9 credits. F.S.SS.

Linguistics

http://arts-sciences.und.edu/summer-institute-of-linguistics

FACULTY: Allen, Baart, Baker, Bickford (Program Director), Clifton, Fraser, R.
Fried, Hansen, Humnick, Karan, Marlett, Roberts, Slater (Graduate Director),
Snider, Trammel, Walters, and Weber

Degrees Granted: Master of Arts (M.A.) and Graduate Certificate in Community-Based Literacy as Applied Linguistics

The graduate program in Linguistics focuses on theoretically-informed descriptive linguistics in preparation for careers involving minority-language communities and lesser-studied languages. It is particularly appropriate for students anticipating careers in language development, documenting minority languages, language survey, translation, and literacy. It is a cooperative program between UND and SIL International, and operates primarily during a nine-week summer session every year.

Degrees Granted: Master of Arts (M.A.)

Mission Statement and Program Goals

The Graduate Program in Linguistics provides intensive graduate instruction, integrating linguistic theory with practical application, in the areas of language research, documentation, description, and development of linguistic resources such as writing systems, literacy, native literature, and translated materials.
The distinctive focus of the program relates to work in multicultural, multilingual settings involving both major and lesser-studied languages, both spoken and signed. It is designed to move students toward careers involving linguistic analysis, acquisition of languages and cultures, linguistic community development, literacy, or translation.

Goal 1: Students will demonstrate knowledge of selected disciplinary subfields, publications and theoretical approaches within the field of linguistics.

Goal 2: Students will demonstrate ability to conduct independent research in the field of linguistics, especially in languages and situations where relatively little previous study has been undertaken.

Master of Arts (M.A.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.
2. A minimum of 20 semester credits in linguistics or related fields, e.g., foreign language, of which at least 10 credits must be in linguistics, and which must include the equivalent of LING 452 Syntax and Morphology I.
3. A cumulative Grade Point Average (GPA) of at least 2.8 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. Students deficient in prerequisite credits (see #2 above) should generally plan to take their first summer as non-degree graduate students. Up to nine credits taken as a non-degree graduate student can be applied to the M.A. Therefore, students who meet some, but not all, of the prerequisites can use some of the credits gained as non-degree graduate students to meet the prerequisites, and apply some to the M.A. Foreign language proficiency may be demonstrated by passing an examination in the language in lieu of formal credits.

Degree Requirements

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Linguistics Program.

1. A minimum of 32 credits including:
   a. 3 credits listed in the Linguistics section of the graduate catalog in the area of phonetics/phonology
   b. 3 credits in Linguistics in syntax/semantics
   c. 3 credits in Linguistics in applied linguistics
   d. LING 580 Academic Writing in Linguistics
   e. 4 credits for a thesis
   f. At least 5 other credits in Linguistics
2. Of the remaining 13 credits, courses with linguistics content offered by other departments, such as English, may be counted as linguistics credits for the major.
3. Up to 4 credits of Directed Study and Research courses, e.g., LING 590 Directed Studies in Linguistics and LING 594 Research in Linguistics, may be used to supplement the standard graduate course offerings.
4. Nine credits may be in a minor or in cognate courses (see the Degree Requirements (http://und-public.coursesleaf.com/graduateacademicinformation/degreetequirements) section of the graduate catalog.)
5. At least one-half of the credits must be at or above the 500-level.
6. Students normally satisfy the residency requirements by spending at least two summers enrolled in the program.
7. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
8. The thesis will be based on the analysis of language data collected by the student or on theoretical or applied applications of data arising from language research.

Certificate Requirements

1. The following courses:
   LING 520 Foundational Issues of Community-based Literacy in Multilingual Societies 3
   LING 521 Literacy Program Planning and Management 3
   LING 522 Materials and Methods in Adult Literacy 3
   LING 530 Introduction to Writing Systems 1
   Total Credits 10

(Students must be accepted into the certificate program before enrolling in any of these courses.)

A maximum of nine credits from this graduate certificate may be used toward the M.A. in linguistics, if the student enrolls in the M.A. program after completing the certificate. No professional accreditation is associated with the certificate.

See more detailed information at: http://arts-sciences.und.edu/summer-institute-of-linguistics.

Courses

LING 502. Acoustic Phonetics. 3 Credits.

This course focuses on the instrumental study of the acoustic properties of speech sounds, speech analysis, experimental techniques, and laboratory work. By the end of the course, students should be confident in their abilities to plan, carry out and analyze the results of experiments in phonetics; and to relate acoustic phonetic data to their linguistic analyses. Basic techniques in experimental phonetics such as recording, annotation, fundamental frequency analysis, formant frequency analysis, and spectrographic analysis will be studied. Prerequisite: LING 450. Prerequisite or Corequisite: LING 451.
LING 503. Phonology II. 3 Credits.
Phonological phenomena examined from current theoretical frameworks; emphasis on creation and testing of hypotheses about the phonological systems of particular languages. The particular theoretical orientation varies depending on the instructor; often, more than one framework is used. The course assumes basic knowledge of rule-based generative phonology. Prerequisites: LING 450 and LING 451, or equivalents.

LING 504. Syntax II. 3 Credits.
Drawing on one or more theories from the generative tradition, this course explores syntactic forms that are commonly attested in human language. There is emphasis on the role of language universals and linguistic argumentation in arriving at analyses of language phenomena. Prerequisite: LING 452.

LING 505. Typology and Discourse. 3 Credits.
The course covers recent trends relating to language typology and cross-linguistic generalizations, focusing on the domains of morphosyntax, semantics and pragmatics. Prerequisite: LING 452.

LING 506. Field Methods. 3 Credits.
Practical aspects of linguistic field work and analysis, including an intensive practicum with speakers of a non-Western language for the purposes of developing skill in data collection, data management (using some computational tools), and the analysis and description of the phonological, grammatical and lexical structures of human languages. Prerequisites: LING 450 or LING 455 or equivalent and LING 452 or equivalent; recommended prerequisite LING 480. Prerequisite or corequisite: LING 451 or LING 516 or equivalent; LING 506L or equivalent. SS.

LING 506L. Media Technology for Linguistic Research. 1 Credit.
Specialized hardware and software tools for linguistic research on spoken or signed languages (recording, analyzing, and presenting data), with focus on digital images, audio and video, as well as transcription and annotation tools for text analysis. Each student focuses on tools for either signed or spoken languages, with separate sections for each; the class may be retaken for credit if the focus is different. Intended to be taken alongside LING 506 Field Methods, but can also be taken independently, as it is also useful in preparation for several other courses, such as Acoustic Phonetics, Sign Language Phonology, Sign Language Morphosyntax, and for a thesis that involves language data collection or language documentation. Repeatable to a maximum of 2 credits. SS.

LING 507. Special Topics in Linguistics. 1-4 Credits.
Topics of current interest in linguistics. May be repeated if topic is different. Repeatable.

LING 510. Semantics and Pragmatics. 3 Credits.
Various dimensions of meaning on the lexical, propositional, and interpropositional levels. Meaning is studied both as a property of linguistic expressions and as derived from contextual factors. Topics include principles of lexicography, selectional restrictions, operators and their scope, illocutionary force, inference, and relations between form and meaning. Prerequisite: LING 452 or equivalent.

LING 511. Translation of Texts: Theory and Practice. 3 Credits.
This course is an introduction to the theory and practice of text translation, emphasizing the accurate, natural and clear transference of meaning across languages and cultures. Current issues in translation theory will be discussed, especially the approach based on Relevance Theory. Practical aspects of the course will include recognizing common translation problems and solutions, maintaining quality control, the role of computation, program planning aspects of translation projects or activities and teaching others to translate. Prerequisites: LING 452 and two years of foreign language or equivalent proficiency. Prerequisite or corequisite: LING 510. SS, even years.

LING 512. Sociolinguistic Methods in Language Survey. 3 Credits.
This course covers the principles of surveying, quantifying, and interpreting data on language attitudes, identity, bilingualism, intelligibility, vitality, language spread, shift, maintenance and death. Prerequisites or Corequisites: LING 450 and LING 470. SS, odd years.

LING 512L. Sociolinguistic Methods in Language Survey. 1 Credit.
This course is an optional lab to be taken alongside LING 512, enabling potential language surveyors to learn some of the core procedures that are recommended to achieve common survey objectives. Prerequisites or Corequisites: LING 450 and LING 470. SS, odd years.

LING 513. Tone Analysis. 3 Credits.
Analysis of tone systems in the world's spoken languages, covering a comprehensive variety of common tonal phenomena and tone systems. Methodology for analyzing a tonal language, so as to clearly and accurately describe its particular tone system. Implications of tone analysis for orthography development. Prerequisites: LING 450, LING 451 and LING 452. SS.

LING 516. Phonology of Signed Languages. 2-3 Credits.
How the basic phonetic elements in a natural signed language function together in the phonological system of the language. Practice in the application of various theoretical frameworks to problem solving and analysis of specific signed languages, and in applying theoretical concepts of general phonology to signed language research. Prerequisites: Proficiency in a natural signed language equivalent to at least one year of college-level study. Prerequisite or Corequisite: LING 455. SS.

LING 519. Introduction to Literacy Principles. 3 Credits.
Introduction to literacy principles, methods, materials and programs in multilingual societies, especially those involving one or more minority languages. Includes language policy and planning, reading theory, materials design, and literacy program design and implementation, with special emphasis on training and assisting members of the minority language community to establish and maintain ongoing literacy programs. Intended as an introduction to the topic for literacy technicians who will be assisting in literacy programs under the direction of experienced literacy specialists, or for field linguists who are not planning to be literacy specialists. Content is similar to the package of courses 520/521/522, but in less depth; it may be taught with some class sessions in common with the larger package. Corequisite: LING 530 is recommended. Prerequisite or Corequisite: LING 470. SS.

LING 520. Foundational Issues of Community-based Literacy in Multilingual Societies. 3 Credits.
Upon completion of this course, students will be able to: (a) explain in detail the inter-relationship between illiteracy, poverty, politics and environment; (b) identify and describe the major movements and trends in literacy; (c) explain and teach the principles of adult education; (d) identify the major "players" in the field of adult literacy; (e) explain the major issues involved in developing a multilingual education program for school children. Corequisites: LING 521 and LING 522. SS, odd years.

LING 521. Literacy Program Planning and Management. 3 Credits.
Upon completion of this course, students will be able to: (a) explain, with examples, change processes in traditional communities; (b) design a complete literacy program; (c) explain alternative strategies for designing and managing a literacy program; (d) evaluate the need for external funding in a literacy program; (e) do detailed costing for a literacy program; (f) write a funding proposal for a literacy program; and (g) use the LinguaLinks Electronic Performance Support system and access relevant Internet resources. Corequisites: LING 520 and LING 522. SS, odd years.

LING 522. Materials and Methods in Adult Literacy. 3 Credits.
Upon completion of this course, students will be able to: (a) explain some of the major theories of reading and the history of their evolution; (b) explain, describe, and critique various instructional strategies for teaching reading; (c) design instructional materials from any one of five different strategies for teaching reading; (d) design teacher training protocols for literacy programs; (e) design testing protocols for reading materials; (f) develop instructional materials for transitional literacy programs; (g) organize and direct a writers' workshop; and (h) explain the need for postliteracy materials and how to develop these. Corequisites: LING 520 and LING 521. SS, odd years.

LING 526. Morphosyntax of Signed Languages. 2-3 Credits.
Reasons for considering signed languages as natural languages. Morphological and syntactic properties that are characteristic of signed languages and which distinguish them from spoken languages, with brief mention of semantics and discourse. Specific issues important to the analysis of signed languages, including: glossing conventions, grammaticalization of space, deixis and agreement, lexical structure, lexicalized borrowing, verb classes, aspect, classifiers, iconicity and metaphor, nonmanuals, and information structure. Prerequisite: LING 452 and proficiency in a natural signed language equivalent to at least one year of college-level study. SS.
LING 530. Introduction to Writing Systems. 1 Credit.
Introduction to the principles of designing and testing a writing system for a spoken or signed language. Attention is given to linguistic, sociolinguistic, educational, psycholinguistic, political/ideological, production and implementation issues in orthographic development. Prerequisite or corequisite: Either a) prerequisite LING 470 and corequisite LING 451; b) prerequisite LING 470 and corequisite LING 516; or c) corequisites LING 520, LING 521 and LING 522. SS.

LING 534. Historical Linguistics. 3 Credits.
Discovery of historical relationships between languages with primary focus on the comparative method for identifying regular sound changes and reconstructing parent languages, as well as identifying contact-induced changes such as areal diffusion and borrowing. Some coverage of internal reconstruction and historical morphology/syntax. Historical linguistics has applications for language survey, language planning and development and adaptation of translated materials between related languages. Prerequisites: LING 451 and LING 470 or equivalents. SS.

LING 535. Ethnographic Methods in Field Linguistics. 3 Credits.
Major areas within cultural anthropology (social, political, economic, religious, etc.) particularly with respect to issues that affect how one conducts field linguistic research and language development projects in a cross-cultural context, and which emphasize the interrelatedness of language and culture. Methods of ethnographic field methods for collecting cultural data, including practical experience in applying those methods in a research project. Recommended to be taken at the same time as LING 506, Field Methods, because of the possibilities for integrated assignments between the two courses. Prerequisite: 6 credits in linguistics or consent of instructor.

LING 580. Academic Writing in Linguistics. 1 Credit.
Instruction and practice in academic writing within the field of linguistics. All students will be required to submit a sample of their writing for peer review, and review fellow students’ writing. Prerequisite: Acceptance to the MA program in Linguistics or permission of the instructor. SS.

LING 590. Directed Studies in Linguistics. 1-4 Credits.
Supervised individual study. May be repeated if the topic is different. A maximum of 4 credits in LING 590 and 594 may be applied to the M.A. in linguistics. Repeatable to 4 credits.

LING 594. Research in Linguistics. 1-4 Credits.
Supervised individual research. May be repeated if topic is different. A maximum of 4 credits in LING 590 and 594 may be applied to the M.A. in linguistics. Repeatable to 4 credits.

LING 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

LING 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

Undergraduate Courses for Graduate Credit

LING 450. Articulatory Phonetics. 2 Credits.
Introduction to the theory and practice of articulatory phonetics. SS.

LING 451. Phonology I. 3 Credits.
Introduction to phonological analysis; intensive practice in applying theoretical principles to problem solving and to field techniques. Prerequisite: LING 450 or with permission of the instructor ENGL 209 as a prerequisite and LING 450 as a corequisite. SS.

LING 470. Introduction to Sociolinguistics and Language Development. 2 Credits.
Introduction to language variation as influenced by social interaction, with special attention to participatory language development in multilingual societies. SS.

Mathematics

http://www.und.edu/dept/math/mathhome.html

FACULTY: Bartz, Bevelacqua, Collings, Dearden, Dunnigan (Graduate Director), Halcrow, Hong, J. Iiams, M. Iiams, Khavanin, Millsapgh, Minnottte, Peterson, Richards, Takahashi and Zerr

Degrees Granted: Master of Science (M.S.) and Master of Education (M.Ed.)

The Department offers courses leading to the M.S. (thesis and non-thesis) and M.Ed. degrees with a major in mathematics. The Department also offers a graduate minor in statistics.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Mathematics Department graduate program is to provide a quality education in a variety of areas at the master’s level and to produce graduates who are qualified to pursue doctoral work, if they should desire, or careers in government, industry, and teaching. The program maintains high standards while also providing an atmosphere in which capable students with less developed academic backgrounds can maximize their potentials. The program attempts to immerse students in an atmosphere of scholarly and creative activity in a way that will encourage them to interact with each other, with the faculty, and with undergraduates. The program seeks to expand the creative abilities of students and encourages them to communicate their results effectively in written and oral forms and to become involved in mathematical and social communities. Overall, the mission is to produce graduates who love to create and use mathematics and who are able to take an active part in their own learning.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. The equivalent of a bachelor’s degree with a major in mathematics.
2. A cumulative grade point average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A=4.0).
3. Students who have not completed the equivalent of MATH 431 Introduction to Real Analysis will be required to do so as part of their graduate program.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog. Students without the required degree, or equivalent, may be admitted but will be required to satisfactorily complete undergraduate courses to make up their deficiency before advancement to Approved status.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Mathematics Department.

Thesis Option

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include 20 credits from the major department, and a minor or cognate area must include at least nine credits.
3. At least one-half of the credits must be at or above the 500-level.
4. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
5. Comprehensive final examination.
6. Required Courses:
   Select two of the following sequences:
   - MATH 512 Modern Analysis I
     & MATH 513 Modern Analysis II
   - MATH 515 Applied Mathematics
     & MATH 516 Applied Mathematics
Master of Education (M.Ed.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Satisfy the undergraduate requirements in Education, i.e., 18 credit hours in Education including student teaching.
2. The equivalent of a bachelor’s degree with a major in mathematics.
3. A cumulative grade point average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A=4.0).
4. Students who have not completed the equivalent of the following courses will be required to do so as part of their graduate program.
5. MATH 409 Geometry
   MATH 421 Statistical Theory I
   MATH 431 Introduction to Analysis I
   MATH 441 Abstract Algebra
   MATH 442 Linear Algebra
   3

6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Non-Thesis Option

1. Thirty-two (32) credits including a minimum of two credits of MATH 997 Independent Study.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include 20 credits from the major department, and a minor or cognate area must include at least nine credits.
5. Preparation of a written independent study approved by the faculty advisor.
6. Comprehensive final examination.
7. Required Courses:
   - Select two of the following sequences:
     MATH 512 Modern Analysis I
     MATH 513 Modern Analysis II
     & MATH 515 Applied Mathematics
     MATH 516 and Applied Mathematics
     MATH 518 Algebra I
     & MATH 519 and Algebra II
     MATH 520 Topology I
     & MATH 521 and Topology II
     MATH 541 Linear Statistical Models
     & MATH 542 and Advanced Topics in Statistics and Probability
   - At least one additional graduate level mathematics course
   - MATH 997 Independent Study
   - Electives/Cognates
   - 12

Degree Requirements

1. A minimum of 32 semester credits is required for the M.Ed. degree, including two credits for the independent study.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. A minimum of 16 credits, including 2 for the independent study, in Mathematics with at least 8 credits at or above the 500 level as approved by the department.
5. A minimum of 6 credits in an area cognate to the area of concentration.
6. The courses T&L 569, EFR 500, T&L 580, MATH 505 Seminar: Methods and Materials for Secondary Mathematics will be required.
7. Preparation of a written independent study approved by the faculty advisor.
8. Comprehensive final exam.

Graduate Minor in Statistics

The requirements consist of 9 hours of which MATH 421 Statistical Theory I and MATH 422 Statistical Theory II are required if they were not taken as an undergraduate. The remaining credits may be selected from various probability and statistics-oriented courses in mathematics and other disciplines. For further information about this option, contact the chair of the Mathematics Department.

Courses

MATH 505. Seminar in Mathematics. 1-3 Credits.
Repeatable.

MATH 512. Modern Analysis I. 3 Credits.
Algebras and â - algebras, Borel sets, measures, measurable sets and Lebesgue measure, non-measurable sets, measurable functions, the definition and basic properties of the Lebesgue integral, Fatou's lemma, the monotone convergence theorem, and Lebesgue's dominated convergence theorem. Prerequisite: MATH 432.

MATH 513. Modern Analysis II. 3 Credits.
Product measures, Fubini's theorem, the Radon Nikodym theorem, inequalities of Hölder and Minkowski, definitions and basic properties of normed spaces and Banach spaces, some classical Banach spaces such as Lp and lp, bounded linear operators, and dual spaces. Prerequisite: MATH 512.

MATH 515. Applied Mathematics. 3 Credits.
The content of the course varies but includes current topics in applied mathematics such as: (1) ordinary or partial differential equations, (2) approximation theory and perturbation techniques, (3) modeling and computer simulation, (4) special functions, (5) numerical analysis, (6) variational methods, (7) transforms, (8) integral equations. Prerequisite: MATH 266 or consent of instructor.

MATH 516. Applied Mathematics. 3 Credits.
The content of the course varies but includes current topics in applied mathematics such as: (1) ordinary or partial differential equations, (2) approximation theory and perturbation techniques, (3) modeling and computer simulation, (4) special functions, (5) numerical analysis, (6) variational methods, (7) transforms, (8) integral equations. Prerequisite: MATH 266 or consent of instructor.

MATH 518. Algebra I. 3 Credits.
Group theory, rings and fields, vector spaces, Galois theory and finite fields. Prerequisites: MATH 441 and MATH 442.

MATH 519. Algebra II. 3 Credits.
Group theory, rings and fields, vector spaces, Galois theory and finite fields. Prerequisites: MATH 441 and MATH 442.

MATH 520. Topology I. 3 Credits.
Point set topology, including metric spaces and such topics as homeomorphisms, separation axioms, compactness, connectedness, general convergence, compactification and metrizability. Prerequisite: MATH 431.

MATH 521. Topology II. 3 Credits.
Point set topology, including metric spaces and such topics as homeomorphisms, separation axioms, compactness, connectedness, general convergence, compactification and metrizability. Prerequisite: MATH 431.
MATH 541. Linear Statistical Models. 3 Credits.
Distributions of quadratic forms, general linear hypotheses of full rank, least squares, Gauss-Markoff theorem, estimability, parametric transformations, Cochran's theorem, projection operators and conditional inverses in generalized least squares, applications to ANOVA and experimental design models. Prerequisite: MATH 422 or consent of instructor.

MATH 542. Advanced Topics in Statistics and Probability. 3 Credits.
The content of the course varies but may include (but is not restricted to) current topics in statistics and probability such as (1) time series, (2) sampling, (3) nonparametric statistics, (4) experimental design, (5) probability theory, (6) statistical theory, (7) multivariate statistical analysis. Prerequisite: MATH 541 or consent of instructor.

MATH 576. Algebra and Geometry for Middle School Teachers. 3 Credits.
Algebra and Geometry course intended for middle school teachers: a) planning to qualify to teach middle school mathematics; or b) teachers looking to enrich their content knowledge in mathematics. Topics may include: rational number system, introduction to number theory, algebraic thinking, spatial reasoning and representation, introduction to Euclidean and non-Euclidean geometry, problem solving and pedagogical issues. May not be used in Ph.D. or Master's programs. Prerequisites: Licensed K-12 teacher, College Algebra, and instructor consent.

MATH 577. Calculus Concepts for Middle School Teachers. 3 Credits.
Calculus course intended for middle school teachers: a) planning to qualify to teach middle school mathematics; or b) teachers looking to enrich their content knowledge in mathematics. Topics may include: analysis of functions, mathematical modeling, limits, continuity, differentiation, integration, and pedagogical issues. May not be used in Ph.D. or Master's programs. Prerequisites: Licensed K-12 teacher, College Algebra, and instructor consent.

MATH 584. Theory of Numbers. 3 Credits.
Real numbers, number system, division algorithm, integers, divisors, primes, greatest common divisor, least common multiple, congruences, theorems of Euler and Fermat, quadratic residues, Primitive roots, and applications. Prerequisite: MATH 206 or consent of instructor.
The mission of the Master of Science Medical Laboratory Science (MS, MLS) program at the University of North Dakota is to generate and disseminate an advanced scholarly curriculum through distance and on-campus courses to baccalaureate degree, certified medical laboratory science professionals throughout the state, nation, and world. The curriculum is designed to prepare graduates for leadership roles in education, consulting, and healthcare administration.

**Goal 1:** Students will understand the role of the clinical laboratory in producing positive patient outcomes, and be able to communicate that role within a team of healthcare professionals.

**Goal 2:** Students will be prepared to identify, critically assess, and/or problem solve issues related to professional practice in the field.

**Goal 3:** Students will demonstrate knowledge of an advanced scholarly curriculum that encompasses the scope of practice in medical laboratory science.

**Goal 4:** Students will strengthen professional communication skills to be utilized across multiple topics or disciplines.

### Master of Science (M.S.)

#### Admission Requirements

Applicants who are seeking admission to School of Graduate Studies must meet all of the minimum general School of Graduate Studies admission requirements identified in the graduate catalog. In addition, prospective students must fulfill the following requirements for admission to the graduate program in Medical Laboratory Science. Application deadlines can be found on the MLS or UND School of Graduate Studies websites.

1. B.A. or B.S. degree and successful completion of the MLS (NCA), MT (ASCP) certification examinations (include proof of certification with School of Graduate Studies application).
2. Cumulative Grade Point Average (GPA) of at least 3.0 (on a 4.0 scale) for the junior and senior years of undergraduate work.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. At least two years of prior work experience in a medical laboratory is preferred (include a resume of applicable work experience with School of Graduate Studies application).

#### Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Medical Lab Science Program.

1. A minimum of 33 semester credits as follows (see 'Curriculum' for course lists):
   - Foundation Courses = 12 Credits
   - Core Courses = 12 Credits
   - Elective Courses = 9 Credits
2. A cognate area of study or minor (minimum of 9 credits) is optional.
3. Successful completion of comprehensive examinations that takes place at the end of the student's program of study.

### Curriculum

#### FOUNDATION COURSES

All Foundation Courses are required for degree completion. Each course is offered at least annually. MLS 524 has a 1-week on-campus residency requirement that must be completed during the first or second fall semester of coursework. MLS 515 also has a 1-week on-campus residency requirement that must be completed during the spring semester closest to degree completion.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLS 501</td>
<td>Advanced Laboratory Practice: Technical Concepts</td>
<td>3</td>
</tr>
<tr>
<td>MLS 515</td>
<td>Capstone in Medical Laboratory Science</td>
<td>2</td>
</tr>
<tr>
<td>MLS 524</td>
<td>Current Trends and Issues in Medical Laboratory Science</td>
<td>2</td>
</tr>
<tr>
<td>MLS 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>MLS 525</td>
<td>Professional Communication in the Medical Laboratory</td>
<td>3</td>
</tr>
</tbody>
</table>
**CORE COURSES**

At least 12 credits of Core Courses (from a minimum of 4 separate courses) of the listed Core Courses are required for degree completion. Core Course credits beyond 12 can be counted as Elective credits. Core Courses are offered on a 3-year cycle.

- MLS 502 Advanced Clinical Hematology: Erythrocytes 3
- MLS 503 Advanced Clinical Hematology: Leukocytes 3
- MLS 506 Advanced Clinical Chemistry 3
- MLS 507 Advanced Clinical Immunohematology 3
- MLS 513 Advanced Clinical Immunology 3
- MLS 518 Advanced Molecular Diagnostics 3
- MLS 522 Advanced Clinical Bacteriology 3

*Only one of these courses can be counted as a Core Course (if both are taken, the second would be counted as an Elective)*

**ELECTIVE COURSES**

At least 9 credits (from a minimum of 3 separate courses) of Elective courses are required for degree completion. Note that any Core Course taken beyond the required 12 credits can also be counted as an Elective course. Elective courses are offered on a 3-year cycle, with the exception of MLS 516 and MLS 591 which are available every fall and spring semester.

- MLS 505 Advanced Laboratory Practice: Financial Management 3
- MLS 508 Leadership for the Laboratory Professional 3
- MLS 509 Medical Laboratory Education: Teaching Principles 3
- MLS 516 Special Topics in Medical Laboratory Science 1-4
- MLS 517 Advanced Laboratory Practice: Administrative Concepts 3
- MLS 523 Advanced Non-Bacterial Microbiology 3
- MLS 526 Advanced Clinical Hemostasis 3
- MLS 527 Medical Laboratory Education: Assessment and Accreditation 3
- MLS 591 Directed Study in Laboratory Medicine 1-6

**Courses**

- **MLS 501. Advanced Laboratory Practice: Technical Concepts. 3 Credits.**
  An examination of technical concepts and skills utilized to ensure quality in the medical laboratory. The course will focus on enhancing quality control analysis and method validation skills, and utilizing statistical tools to monitor and improve quality testing processes in the medical laboratory. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only.

- **MLS 502. Advanced Clinical Hematology: Erythrocytes. 3 Credits.**
  A comprehensive study of human erythrocytes. Included are discussions of normal erythrocyte structure, function, production, regulation, and the pathophysiology of related disorders. The role of current laboratory testing in the diagnosis of erythrocyte disorders will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 503. Advanced Clinical Hematology: Leukocytes. 3 Credits.**
  A comprehensive study of human leukocytes. Included are discussions of normal leukocyte structure, function, production, regulation, and the pathophysiology of related disorders. The role of current laboratory testing in the diagnosis of leukocyte disorders will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 504. Advanced Laboratory Practice: Financial Management. 3 Credits.**
  This course presents an overview of financial management for medical laboratories. Students examine several basic financial operation concepts, including how to evaluate productivity, manage salaries, and manage supply inventories for maximum cost containment. Students learn how to plan for capital expenditures, set laboratory fee rates, and create, implement, and evaluate a budget. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 505. Advanced Clinical Hematology: Leukocytes. 3 Credits.**
  An advanced study of the theories and principles of clinical chemistry. Correlation of laboratory results with associated disease pathophysiology will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 506. Advanced Clinical Chemistry. 3 Credits.**
  A detailed study of human blood groups including laboratory aspects of blood banking with special reference to theoretical and clinical applications. Emphasis will be placed on antibody identification and advanced problem solving techniques. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 507. Advanced Clinical Immunology. 3 Credits.**
  An in-depth investigation of immune system functions. Correlation of laboratory results with normal and disease states will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisites: Restricted to MS in MLS program students only. F.S.

- **MLS 508. Leadership for the Laboratory Professional. 3 Credits.**
  Approaches to teaching in Medical Laboratory Science will be examined, with an emphasis on development of instructional and evaluative materials. Additional topics discussed will include learner diversity, classroom management techniques, and course assessment. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 509. Medical Laboratory Education: Teaching Principles. 3 Credits.**
  Approaches to teaching in Medical Laboratory Science will be examined, with an emphasis on development of instructional and evaluative materials. Additional topics discussed will include learner diversity, classroom management techniques, and course assessment. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisites: Restricted to MS in MLS program students only. F.S.

- **MLS 510. Medical Laboratory Science. 2 Credits.**
  This course is an introductory experience that occurs in a face-to-face environment at the end of the degree process. Graduate-level Medical Laboratory Science students reflect upon and consider applications of degree coursework. Additionally, the future of the medical laboratory science profession will be discussed and career opportunities will be explored. Prerequisites: Completion of at least 20 credits in the MLS Master of Science Program; MLS program students only. S.

- **MLS 511. Capstone in Medical Laboratory Science. 2 Credits.**
  This course is a summative experience that occurs in a face-to-face environment at the end of the degree process. Graduate-level Medical Laboratory Science students reflect upon and consider applications of degree coursework. Additionally, the future of the medical laboratory science profession will be discussed and career opportunities will be explored. Prerequisites: Completion of at least 20 credits in the MLS Master of Science Program; MLS program students only. S.

- **MLS 512. Advanced Clinical Hematology: Leukocytes. 3 Credits.**
  A comprehensive study of human leukocytes. Included are discussions of normal leukocyte structure, function, production, regulation, and the pathophysiology of related disorders. The role of current laboratory testing in the diagnosis of leukocyte disorders will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 513. Advanced Clinical Immunology. 3 Credits.**
  An advanced study of the theories and principles of clinical chemistry. Correlation of laboratory results with associated disease pathophysiology will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. Prerequisite: MLS program students only. F.S.

- **MLS 514. Advanced Clinical Bacteriology. 3 Credits.**
  An advanced study of the laboratory diagnosis of bacterial diseases and an in-depth exploration of antibacterial agents. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. F.S.

- **MLS 515. Advanced Non-Bacterial Microbiology. 3 Credits.**
  An advanced study of the laboratory diagnosis of viral, fungal, and parasitic diseases and associated antimicrobial agents. F.S.

- **MLS 516. Special Topics in Medical Laboratory Science. 1-4 Credits.**
  Topical courses in laboratory medicine organized on a semester by semester basis. Prerequisite: MLS program students only. Repeatable to 12 credits. F.S.

- **MLS 517. Advanced Laboratory Practice: Administrative Concepts. 3 Credits.**
  An examination of administrative concepts and skills utilized to ensure quality in the medical laboratory. The course will focus on advanced concepts related to medical laboratory accreditation, inspection, and federal regulations. An emphasis will be placed on the utilization of best practices to monitor and improve laboratory diagnostics. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. F.S.

- **MLS 518. Advanced Molecular Diagnostics. 3 Credits.**
  An analysis of specific molecular biology application in the medical laboratory including correlation of cell biology, DNA chemistry, genetics, and laboratory techniques in relation to diagnostic investigations. Course offered in Fall or Spring Semester on a 3-year cycle. F.S.

- **MLS 521. Advanced Clinical Hematology. 3 Credits.**
  An advanced study of the laboratory diagnosis of bacterial diseases and an in-depth exploration of antibacterial agents. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. F.S.

- **MLS 522. Advanced Clinical Bacteriology. 3 Credits.**
  An advanced study of the laboratory diagnosis of viral, fungal, and parasitic diseases and associated antimicrobial agents. F.S.

- **MLS 523. Advanced Non-Bacterial Microbiology. 3 Credits.**
  An advanced study of the laboratory diagnosis of viral, fungal, and parasitic diseases and associated antimicrobial agents. F.S.
MLS 525. Professional Communication in the Medical Laboratory. 3 Credits.
This course will focus on developing written and oral communication skills as a foundation for application within the medical laboratory profession. Students will learn how to identify, assess, and incorporate appropriate reference materials to prepare professional, scholarly papers and presentations. Prerequisite: Must be satisfactorily completed in the first or second semester of degree coursework. F.S.

MLS 526. Advanced Clinical Hemostasis. 3 Credits.
A comprehensive study of the human hemostatic system. Normal function, disease pathophysiology, and the evolution of hemostasis in healthcare will be discussed. The laboratory’s role in the diagnosis and/or monitoring of bleeding and clotting disorders will be emphasized. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. F.S.

MLS 527. Medical Laboratory Education: Assessment and Accreditation. 3 Credits.
This course will focus on assessment and accreditation specific to medical laboratory education programs. Topics will include examination of assessment at the classroom, program, and institutional levels, including how to create and implement an assessment plan. Medical laboratory education accreditation processes will also be examined, with an emphasis on the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) standards. Offered once per 3-year cycle (fall or spring semester). See program website for current course rotation. F.S.

MLS 591. Directed Study in Laboratory Medicine. 1-6 Credits.
Designed to meet the needs of individual student-focused studies in laboratory medicine. Prerequisite: Restricted to Master of Medical Lab Science students. Repeatable to 6 credits. On demand.

MLS 996. Continuing Enrollment. 1-12 Credits.
Prerequisite: MLS program students only. Repeatable. S/U grading.

MLS 997. Independent Study. 2 Credits.
The independent study is a culminating experience for Medical Laboratory Science graduate students. Utilizing skills and information acquired throughout the degree process, students will select, investigate, and present findings of a topic with significance to the major field of study. Prerequisite: MLS program students only. F.S.

Microbiology and Immunology

The Microbiology & Immunology program is no longer accepting applications.

Please go to the Biomedical Sciences page at:
http://und-public.courseleaf.com/graduateacademicinformation/
departmentalcoursesprograms/biomedicalsCIences/

The four graduate programs (Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, and Pharmacology, Physiology & Therapeutics) at the University of North Dakota School of Medicine and Health Sciences are now combined into an integrated, multi-disciplinary program in Biomedical Sciences. Students that entered the programs in fall 2014 will follow the newly developed curriculum and will become a part of the Biomedical Sciences graduate program. Students who enrolled in the four programs previous to fall 2014 will have the option of either completing degree requirements for the program in which they enrolled (found in previous UND Academic Catalogs) or transferring to and completing degree requirements for the Biomedical Sciences graduate program.

Master of Science (M.S.)

Admission Requirements
Applications for admission are accepted throughout the year. However, priority will be given to applications received by February 15 for Fall admission as awarding of financial aid for the next academic year is decided in March and early April.

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor’s degree from an accredited institution and good academic record in the sciences.

Doctor of Philosophy (Ph.D.)

Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Bachelor’s degree from an accredited institution and good academic record in the sciences.

2. A minimum grade point average of 3.0 on a 4.0 scale.

3. The Graduate Record Examination General Test.

4. A course in Microbiology and a background in chemistry, preferably through organic chemistry, are recommended.

5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Microbiology and Immunology Department.

1. A minimum of 30 credit hours including research and thesis.

2. A grade of at least B in BIMD 500 Cellular and Molecules of Biomedical Science.

3. Completion of BIMD 510 Basic Biomedical Statistics, BIMD 513 Seminars in Biomedical Science and BIMD 516 Responsible Conduct of Research.


5. Completion of one credit each of MBIO 507 Seminar in Microbiology and MBIO 511 Microbiology and Immunology Literature.

6. Completion of MBIO 509 Immunology.

7. Completion of two of the following (4 credits):
   - MBIO 501 Molecular Virology
   - MBIO 504 Microbial Physiology
   - MBIO 508 Microbial Pathogenesis
   - MBIO 512 Microbial Genetics
   - MBIO 519 Advanced Immunology
   - MBIO 591 Special Problems in Microbiology

8. An overall GPA of at least 3.0.


10. Minimum course requirements as follows:
    - BIMD 500 Cellular and Molecular Foundations of Biomedical Science 6
    - BIMD 510 Basic Biomedical Statistics 2
    - BIMD 513 Seminars in Biomedical Science 1
    - BIMD 516 Responsible Conduct of Research 1
    - MBIO 507 Seminar in Microbiology 1
    - MBIO 509 Immunology 3
    - MBIO 511 Microbiology and Immunology Literature 1
    - MBIO 513 Research Tools 2
    - MBIO 590 Research in Microbiology & Therapeutics 4-9
    - MBIO 998 Thesis 1-6

Select two of the following:

- MBIO 501 Molecular Virology
- MBIO 504 Microbial Physiology
- MBIO 508 Microbial Pathogenesis
- MBIO 512 Microbial Genetics
- MBIO 519 Advanced Immunology
- MBIO 591 Special Problems in Microbiology

Total Credits 25-30
4. A course in Microbiology and a background in chemistry, preferably through organic chemistry, are recommended.

Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Microbiology and Immunology Department.

1. A minimum of 90 credit hours including research and dissertation.
2. A grade of at least B in BIMD 500 Cellular and Molecular Foundations of Biomedical Science.
3. Completion of BIMD 510 Basic Biomedical Statistics, BIMD 513 Seminars in Biomedical Science and BIMD 516 Responsible Conduct of Research.
5. Completions of one credit each of MBIO 507 Seminar in Microbiology and MBIO 511 Microbiology and Immunology Literature.
6. Completion of MBIO 509 Immunology.
7. Completion of four of the following (8 credits):
   - MBIO 501 Molecular Virology
   - MBIO 504 Microbial Physiology
   - MBIO 508 Microbial Pathogenesis
   - MBIO 512 Microbial Genetics
   - MBIO 519 Advanced Immunology
   - MBIO 591 Special Problems in Microbiology
   
8. An overall GPA of at least 3.0.
10. Minimum course requirements as follows:
    - BIMD 500 Cellular and Molecular Foundations of Biomedical Science
    - BIMD 510 Basic Biomedical Statistics
    - BIMD 513 Seminars in Biomedical Science
    - BIMD 516 Responsible Conduct of Research
    - MBIO 507 Seminar in Microbiology
    - MBIO 509 Immunology
    - MBIO 511 Microbiology and Immunology Literature
    - MBIO 513 Research Tools
    - MBIO 590 Research in Microbiology
    - MBIO 999 and Dissertation (MBIO 590: up to 59 cr)

Select four of the following:

- MBIO 501 Molecular Virology
- MBIO 504 Microbial Physiology
- MBIO 508 Microbial Pathogenesis
- MBIO 512 Microbial Genetics
- MBIO 519 Advanced Immunology
- MBIO 591 Special Problems in Microbiology

**Combined Ph.D./M.D.**

Through the cooperation of the School of Graduate Studies and the School of Medicine, students may concurrently pursue the Doctor of Philosophy degree in a medical science field (Anatomy and Cell Biology, Biochemistry and Molecular Biology, Microbiology and Immunology, Pharmacology, Physiology, and Therapeutics) and the Doctor of Medicine degree. The minimum time required to complete the joint program is six years of full-time academic study.

Students interested in the joint M.D./Ph.D. program should first obtain admission to the School of Medicine and Health Sciences to the M.D. program, following the normal application process and meeting the selection criteria. A student admitted to the M.D. program may apply to the School of Graduate Studies as soon as he/she has selected a graduate program, which may occur before matriculation in Medical School but not later than the end of the first year of Medical School.

Final admission requirements for the M.D./Ph.D. program include:

1. Satisfactory performance in the first two years of the medical education curriculum with passing scores on all required assessment tools.
2. Successful completion of the USMLE Step 1 examination.
3. Satisfactory scores achieved on General and Subject GRE examination or MCAT scores.
4. All other UND School of Graduate Studies admission requirements listed in the UND Academic Catalog.

If admission to a Ph.D. program is granted, the student should apply to the School of Medicine and Health Sciences Student Performance and Recognition Committee for a “modification of original program” which will allow the student to pursue the M.D. degree and Ph.D. degree concurrently. The student also must request the Office of Student Affairs to certify to the School of Graduate Studies his/her satisfactory completion of the first two years of the M.D. program.

Students are expected to complete the following general requirements for the Ph.D. degree in a medical science field:

1. Performance of original research of a quality suitable for publication in refereed, professional journals.
2. Pass final examination which includes preparation and oral defense of a satisfactory dissertation.
3. Completion of and .
4. A minimum of 90 credit hours, including research and dissertation.
5. Successful completion of a scholarly tool (Note: May be specified by a department.)
6. Completion of the first two years of the medical education curriculum, transferred as 44 credits toward the Ph.D.

**BIMD Courses**

**BIMD 492. Peer Teaching and Tutoring in Biomedical Sciences. 1-4 Credits.**

A course designed to provide individual students with the opportunity to peer teach and/or tutor for classes in the department of Biomedical Sciences. This experience will occur under the direction of a departmental faculty member. Experiences will have variation dependent on the class the student is assisting with. Open to all students with consent of the faculty member. Repeatable to 12 credits. S/U grading. F,S,SS.

**BIMD 494. Directed Studies. 1-4 Credits.**

A course designed to provide individual students with the opportunity for creative, scholarly and research activities in Biomedical Sciences under the direction of a departmental faculty member. Repeatable to 12 credits.

**BIMD 501. Scientific Discovery I. 6 Credits.**

A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will acquire skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. F.

**BIMD 502. Scientific Discovery II. 6 Credits.**

A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will advance their skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. This course is a continuation and advancement of BIMD 501. Prerequisite: BIMD 501. S.

**BIMD 510. Basic Biomedical Statistics. 2 Credits.**

A series of lectures, demonstrations and exercises to provide students with the basic rationales for the use of statistics in the assessment of biomedical data and a selected set of the most common and useful statistical tests. Developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. This course is a continuation and advancement of BIMD 501. Prerequisite: BIMD 500 or permission of course director. S.

**BIMD 513. Seminars in Biomedical Science. 1 Credit.**

A series of presentations on original research conducted by UND faculty members as well as extramural leaders in academic and industrial research in the biomedical sciences. Students will participate through assigned reading and writing exercises related to the presentations.
BIMD 514. Foundations of Bioinformatics. 3 Credits.
In this course, students will learn fundamental concepts and methods in bioinformatics, a field at the intersection of biology and computing. The course surveys a wide range of topics including bioinformatics web resources, computational sequence analysis, sequence homology searching and motif finding, transcriptome analysis, and network/pathway analysis. Students will also have opportunities to learn about available bioinformatics web-resources (e.g., UCSC Genome Browser, STRING/BioGRID interaction databases, and etc), next-generation sequencing analysis (focusing on RNA-Seq data) as well as relevant data-analysis tools (R and BioConductor, Ingenuity Pathway Analysis, DAVID, etc). The course will also familiarize students with the Linux environment and computational tools needed to manipulate and analyze large biological sequencing data sets. Students will need a familiarity with basic biomedical concepts and basic knowledge of computer usage. No programming skills are required. Students should bring their own wifi-enabled laptop to lectures to fully benefit from the hands-on components of each lecture. Prerequisite: Open to graduate and senior undergraduate students with permission of the instructor. F.

BIMD 516. Responsible Conduct of Research. 2 Credits.
A series of lectures and discussion sessions covering topics related to responsible conduct in research. Students will examine a variety of issues including introduction to ethical decision making, the experience of conflict, laboratory practices, data management, reporting of research, conflict of interest, and compliance. Examples and case studies will be drawn primarily from the biomedical sciences. F.

BIMD 517. Principles of Histology. 3 Credits.
Principles of Histology is a laboratory and discussion based course that builds on prior experience in cell biology and involves a strong self-study component through the use of virtual slides as well as lecture and laboratory orientation videos. By the end of the course the student will have demonstrated a significant knowledge base of tissue microanatomy sufficient for understanding and applying the principles to a wide range of research projects. The student will also have gained sufficient knowledge of histology to be capable of teaching this material to medical, professional, graduate, and undergraduate students. Prerequisite: PATH 500 or permission of instructor. S.

BIMD 518. Grant Writing. 2 Credits.
This is an advanced graduate grant writing and oral presentation course. The objectives of this course are to challenge students: (1) to critically evaluate their own research in an effort to clearly define the significance and innovation of their project, (2) to begin to develop novel ideas based on their research efforts that have the potential to significantly impact their field of study, and (3) to prepare students to present these ideas orally and in writing in a manner that is both logical and convincing. Prerequisites: BIMD 501 and BIMD 502, or consent of instructor. F.

BIMD 520. Principles of Neuroanatomy. 2 Credits.
In this course students will learn the fundamental principles of neuroscience, particularly gross and cellular anatomy, development and systems physiology of the nervous system. Behavioral, cognitive and clinical manifestations of abnormal neural functions will also be addressed. Prerequisite: BIMD 502 or permission of instructor. F.

BIMD 521. Neurophysiology. 2 Credits.
This course is designed to introduce students to the electrical properties of neuronal membranes. The course is organized to first provide a brief review of the basic properties of semi-permeable membranes. The electrical and biochemistry principles that apply to neuronal membranes are discussed. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 522. Principles of Neuropharmacology. 2 Credits.
This course is designed to introduce students to the latest developments in molecular neuropharmacology. The course directive is to provide an up-to-date foundation for clinical neuroscience by emphasizing a comprehensive molecular and cellular approach to the effects of drugs on the nervous system. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 523. Neurochemical Basis of the Nervous System. 2 Credits.
This course is designed to introduce students to fundamental concepts of brain metabolism and neurochemical signaling. It emphasizes recent advances in understanding brain biochemical processes and molecular mechanisms occurring in health and disease. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 524. Neurodegenerative Diseases and Pathophysiology. 2 Credits.
This course exposes students to diverse neurodegenerative diseases and nervous system pathophysiology. The emphasis is on mechanistic understanding of the most recent advances in the field. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 525. Readings in Neuroscience. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 526. Medical Experiences for Graduate Students. 1 Credit.
The goal of this course is to introduce the graduate student to a “disease-specific” clinical experience so that the student can acquire a better understanding of the importance of translational medicine, develop a firm appreciation of a patient’s and a physician’s understanding of disease and its treatment, and to introduce the student to the overall culture of clinical research. Prerequisites: Successful completion of comprehensive exam and permission of academic advisor and Instructor of Record; student should initiate discussion with the Instructor of Record at least one month prior to the start of enrollment. S/U grading. On demand.

BIMD 530. Components of the Immune System. 2 Credits.
Have you ever wondered why you don’t get sick every time you breathe air which can carry as many as 2000 different kinds of microbes on any given day? Or what keeps your defense system from attacking your own cells but can get rid of most invaders without you even noticing? This is the amazing task of your fascinating immune system! This course will provide an overview of cellular and molecular components of mammalian immune system and their function. The students will learn how these components are derived and how they interact and communicate with each other to coordinate a response to pathological insults in order to protect the human body. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 531. Components of Microbial Pathogenesis. 2 Credits.
The objective of the course is to provide students with a background in the mechanisms of microbial pathogenesis. Students will learn basic principles of host-parasite interactions. Paradigms of host-parasite interactions will be illustrated by studying, at the molecular and cellular levels, specific infectious diseases and the agents that cause them. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 532. Microbial Gene Regulation. 1 Credit.
This course will provide an understanding of genetic regulation in bacteria. Classic pathways will be examined as paradigms of regulatory circuits. These examples will be expanded to learn how bacteria exploit host cells as well as the use of bacterial regulatory circuits in modern molecular biology. S.

BIMD 533. Microbial Membranes and Transport. 1 Credit.
This course will explore bacterial membranes with particular emphasis on generation of energy and transport of molecules across the membranes. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 534. Microbial Cell Structure and Function. 1 Credit.
Microbial cells have unique structures that relate their functions. Students completing this course will have an understanding of how prokaryotic and eukaryotic organisms differ and how different structures can be used to obtain similar functions. They will understand how microbial structures influence interactions between microbes and between microbes and eukaryotic organisms. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 535. Bacterial Host: Pathogen Interactions. 1 Credit.
The objective of the course is to provide students with a background in the fundamental aspects that occur at the bacterial: host interface. Students will learn the interplay between bacterial virulence factors, strategies used to evade host defenses, and host responses to infection. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 536. Molecular Biology and Pathogenesis of Viruses. 1 Credit.
This course will cover the structure, replication, and pathogenesis of human RNA and DNA viruses, the host immune response to viral infection and the strategies employed by viruses to escape immune detection and elimination. Prerequisite: BIMD 502 or consent of instructor. S.
BIMD 537. Host-Pathogen Interactions Involving Eukaryotic Microbes (Parasites/Fungi). 1 Credit.
Eukaryotic microbe infections have a devastating impact on global health and economic development as they infect over one third of the world’s population and cause acute and chronic pathologies. Furthermore, macroscopic parasites (helminths/ worms) are master regulators of host inflammatory response and hence reduce the immune response to coinfections and negatively affect the success of vaccination programs against many other pathogens. In contrast, it has been proposed that the rise in autoimmune diseases in the developed world could be a direct result of the successful complete elimination of parasitic helminths in these communities. Thus, the purpose of this course is to provide a basic knowledge of the clinically important eukaryotic microbe pathogens and the immune response associated with their infections. A series of lectures will cover course components; a) basic introduction to protozoa, helminth, and fungi, and b) basic knowledge of the immune response and its involvement in parasitic/ fungal infections. An effort has been made to increase clinical relevance and problem-solving skills through a team-learning exercise involving quiz and paper presentations. S.

BIMD 538. Immunological Disorders. 1 Credit.
This course will include discussion of cellular and molecular immunopathologies leading to autoimmune diseases, and primary and secondary immunodeficiencies; and the role of the immune system in tumorigeneses and transplantation, as well as various methods of modification of the immune response. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 539. Readings in Microbiology and Immunology. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 590. Research. 1-12 Credits.
The course allows research in pertinent problems in various aspects of biomedical sciences. Repeatable. F,S,SS.

BIMD 591. Advanced Topics in Biomedical Sciences. 1-3 Credits.
A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the biomedical sciences. Repeatable as topics vary. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 6 credits. On demand.

BIMD 598. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F,S,SS.

BIMD 599. Dissertation. 1-12 Credits.
Completion of dissertation required for Ph.D. Repeatable to 12 credits. F,S,SS.

MBIO Courses

MBIO 507. Seminar in Microbiology. 1 Credit.
S/U grading. F.

MBIO 511. Microbiology and Immunology Literature. 1 Credit.
A series of reports of current scientific literature in Microbiology and Immunology. S/U grading. S.

MBIO 513. Research Tools. 2 Credits.
Orientation to research and laboratory safety. The theory and application of modern laboratory techniques include tissue culture, cell fractionation, enzyme assay, immunization procedures, bacterial growth curves, photomicrography, strain construction, genetic engineering, gel electrophoresis, enzyme immunassay, and western blot techniques are presented. S/U grading. F.

MBIO 515. Advanced Topics. 2 Credits.
A series of topics in microbiology and immunology presented on an episodic basis. The topics may vary, but are expected to include: (A) Immunology, (B) Infectious Diseases, and (C) Molecular Biology. Prerequisite: Previous basic course in the area to be covered.

MBIO 590. Research in Microbiology. 2-6 Credits.
Advanced problems in microbiology and related fields. Hours arranged. Repeatable.

MBIO 591. Special Problems in Microbiology. 1-6 Credits.
Short-term research projects.

MBIO 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

MBIO 997. Independent Study. 2 Credits.

MBIO 998. Thesis. 1-6 Credits.
Repeatable to 8 credits.

MBIO 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

Music

http://arts-sciences.und.edu/music/

FACULTY: Barbu (Graduate Director), Blackburn, Blake, Christopherson, Drago, Gable, Ingle, Lewis, Norman Dearden (Chair), Popejoy, Pugh, Sandberg, Sugiuira, Towne and Wittgraf

Degrees Granted: Master of Music (M.M.) and Doctor of Philosophy (Ph.D.)

The Music Department offers graduate programs leading to the Master of Music degree with specializations in Music Education, Performance, Pedagogy, Composition, Choral Conducting and Instrumental Conducting; and the Doctor of Philosophy degree in Music Education.

The mission of the University of North Dakota Department of Music is to inspire our students and community through education, performance, scholarship, and human relationships in music. Our professional and liberal arts degrees provide rigorous courses of study that cultivate the highest degree of artistic performance, innovative teaching, thorough professionalism, and critical inquiry. The University of North Dakota is an accredited institutional member of the National Association of Schools of Music.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Music (M.M.)

Mission Statements and Program Goals

Master of Music with a Major in Composition

The Master of Music in Composition provides a rigorous and specialized degree with the focus on developing a student’s mastery of musical materials and construction, in preparation for a career in composition or arranging or further advanced study.

Goal 1: Students will develop their compositional abilities and control of musical materials to a high level.

Goal 2: Students will consolidate their general knowledge of musical scholarship and research and approaches to this study.

Master of Music with a Major in Conducting

The Master of Music in Conducting provides a rigorous and specialized degree with the focus on developing a student’s individual musicianship and conducting abilities, in preparation for a performance or teaching career.

Goal 1: Students will develop their conducting and individual performing abilities to a high level.

Goal 2: Students will consolidate their general knowledge of musical scholarship and research and approaches to this study.

Master of Music with a Major in Music Education

The Master of Music in Music Education offers strong academic and professional training in both music and music education through a variety of approaches which aim to deepen the focus of a music educator’s chosen direction and their understanding and implementation of scholarship in their field, either as the capstone of education for public school teaching or in preparation for further graduate study in the field.

Goal 1: Students will develop their focal area (Research or Performance) to a high level.

Goal 2: Students will deepen their understanding of the various aspects of Music Education.
Goal 3: Students will consolidate their general knowledge of musical scholarship and research and approaches to this study.

Master of Music with a Major in Pedagogy
The Master of Music in Pedagogy provides a specialized degree with the focus on developing a student’s applied teaching abilities and individual musicianship, in preparation for a career as an applied music teacher.

Goal 1: Students will develop their pedagogical and performing abilities to high levels.

Goal 2: Students will consolidate their general knowledge of music scholarship and research and approaches to this study.

Master of Music with a Major in Performance
The Master of Music in Performance provides a rigorous and specialized degree with the focus on developing a student’s individual musicianship and performing abilities, in preparation for a performance career or teaching at the university level.

Goal 1: Students will develop their individual musicianship and performing abilities to the highest possible level.

Goal 2: Students will consolidate their general knowledge of musical scholarship and research and approaches to this study.

Doctor of Philosophy (Ph.D.) Music Education

Mission Statement and Program Goals
The Doctor of Philosophy in Music Education offers strong academic and professional training in education and music education through a variety of approaches with the aims of enabling students to produce independent scholarship and teach in higher education, or to provide leadership in music programs at any level.

Goal 1: Students will develop their understanding of Music Education to the highest possible level.

Goal 2: Students will consolidate their general knowledge of musical scholarship and research and approaches to this study.

Master of Music (M.M.)

Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

Minimal Admission Requirements for the Master of Music degree set forth by the Music Department include:

1. A bachelor’s degree with a major in music with competence in the specialty in which graduate study is desired.
2. At least a 2.75 overall GPA and at least a 3.00 GPA for the last two years of undergraduate work.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Additional Admission Requirements for Specific Degrees
(to be sent directly to the Music Department)

Master of Music in All Areas of Performance, Pedagogy or Conducting

1. Audition on the major performing instrument or voice on campus, via virtual live audition, or by live recording of a recent performance.
   a. Coordinate directly with the applied instructor or area conductor (choral or instrumental).
2. Repertoire list of works studied and/or conducted or studied and/or performed on the major performing instrument or voice.
3. Additionally, for Vocal Pedagogy and Vocal Performance: Performance resume; evidence of two years’ satisfactory study of French, German, or Italian; and knowledge of the lyric diction of all three.

Master of Music in Collaborative Piano
1. Audition on campus, via virtual live audition, or by live recording of a recent performance.
   a. Coordinate directly with the applied piano instructor. If auditioning on campus, you must supply your own partners.
2. Resume detailing education and collaborative piano experience.
3. Repertoire list including solo and collaborative piano works (instrumental and vocal).
   a. Use MS Word or PDF format organized first by instrument and/or voice type then by composer in alphabetical order..

Master of Music in Composition
1. A representative sample of compositions.

All students admitted to graduate study in music, whether to Approved, Qualified, or Provisional status, will be examined upon their arrival on campus in order to provide appropriate advisement for the beginning of graduate study. These examinations will cover Music History, Music Theory, and, for Vocal Performance majors, French, German, and Italian lyric diction.

Achievement of a minimum score on the entrance examinations or completion of MUSC 501 Graduate Music Theory Review and MUSC 505 Graduate Music History Review is required prior to registration in MUSC 502 Perspectives in Music Theory and MUSC 508 Perspectives of Music History.

Degree Requirements - M.M. and Ph.D.
All Graduate Music degree programs (M.M. & Ph.D.) require the following Core Courses:

MUSC 500 Introduction to Graduate Study in Music 3
MUSC 502 Perspectives in Music Theory 3
MUSC 508 Perspectives of Music History 3
Total Credits 9

Degree Requirements - M.M.

Students seeking the Master’s degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Music Department.

Degree requirements for the Master of Music degree in Music Department include:

1. 32-38 credit hours in one of the available seven specializations:
   a. Music Education
   b. Performance
   c. Vocal Pedagogy
   d. Composition
   e. Choral Conducting
   f. Instrumental Conducting
   g. Collaborative Piano
2. At least one-half of the credits must be at or above the 500-level.
3. The specialization in Conducting requires at least a one-year residence.

Music Education Specialization

Independent Study Option

Core Courses listed above 9
MUSC 503 Psychological Foundations of Music Learning 3
MUSC 509 Trends in Music Education 3
MUSC 598 Research in Music Education 3
MUSC 997 Independent Study (Music Education topic) 2
Electives in Music Education 6
Electives (from outside Music Education, may be from outside the Department of Music) 6-12
Total Credits 32-38

**Thesis Option**
Core Courses listed above 9
MUSC 503 Psychological Foundations of Music Learning 3
MUSC 509 Trends in Music Education 3
MUSC 598 Research in Music Education 3
Electives in Music Education 6
Electives (from outside Music Education, may be from outside the Department of Music) 4-10
Total Credits 32-38

**Performance Option**
Core Courses listed above 9
Music Education Courses
MUSC 503 Psychological Foundations of Music Learning 3
MUSC 509 Trends in Music Education 3
MUSC 598 Research in Music Education 3
Electives in Music Education 6
Applied Music & Recital (may include conducting)
MUSC 595 Individual Lessons (Conducting students 1 credit, all others 4 credits) 1-4
MUSC 599 Graduate Recital 2
Conducting Courses (required for conducting students only)
MUSC 521 Instrumental Literature 3
or MUSC 524 Choral Literature 3
MUSC 561 Advanced Choral Conducting 2
or MUSC 562 Advanced Instrumental Conducting 2
Electives (from outside Music Education, may be from outside the Department of Music) 0-8
Total Credits 32-38

**Teacher Education Option**
Prerequisite Degree: B.A., B.S., or B.M. in Music or Music Therapy
Core Courses listed above 9
Music Education Courses
MUSC 503 Psychological Foundations of Music Learning 3
MUSC 509 Trends in Music Education 3
MUSC 598 Research in Music Education 3
Conducting Courses
MUSC 521 Instrumental Literature 3
or MUSC 524 Choral Literature 3
MUSC 561 Advanced Choral Conducting 2
or MUSC 562 Advanced Instrumental Conducting 2
Methods Courses
MUSC 440 Methods and Materials for Elementary Music 3
MUSC 441 Methods and Materials for Middle and Secondary School Music 3
Recital
MUSC 599 Graduate Recital 2
Undergraduate coursework to fulfill licensure requirements
MUSC 140 Methods: Woodwinds, Brass, Strings, Percussion, Voice 2-5
MUSC 150 Class Lessons (voice and/or guitar) 1
MUSC 180 Introduction to Music Therapy 3
MUSC 242 Diction for Singers (choral specialization) 1
MUSC 340 Introduction to Music Technology 2
MUSC 423 Instrumental and Choral Arranging 2
MUSC 427 Analysis of Musical Form 2
MUSC 444 Applied Music Pedagogy (choral) 2
MUSC 445 Choral Methods For Directors or MUSC 446 Instrumental Classroom Methods and Materials 3
T&L 250 Introduction to Education 3
T&L 252 Child Development 3
T&L 386 Field Experience 1
T&L 433 Multicultural Education 3
T&L 486 Field Experience 1-4
T&L 487 Student Teaching 4-16
T&L 488 Senior Seminar 1
Total Credits 67-85

All students must demonstrate keyboard proficiency equivalent to level 4; keyboard principals must demonstrate an equivalent level of vocal proficiency.

Some 300 and 400 level courses may be permitted to fulfill graduate elective requirements, subject to School of Graduate Studies academic policies.

**Performance Specialization**
Core Courses listed above 9
Performance Courses
MUSC 596 Individual Lessons 8
MUSC 599 Graduate Recital 2
MUSC 997 Independent Study 2
Other Studies
Electives 3-9
Voice Major
MUSC 525 Vocal Literature 3
MUSC 551 Vocal Pedagogy I 3
MUSC 581 Graduate Opera Workshop 2
Piano Major
MUSC 523 Keyboard Literature 2
MUSC 552 Keyboard Pedagogy I 2
MUSC 578 Seminar for Collaborative Piano 2
MUSC 579 Chamber Ensembles (on Primary Instrument) 2
Instrumental Major
MUSC 522 Solo Instrumental Literature: Violin, Clarinet, Trumpet or Percussion 2
MUSC 555 Instrumental Pedagogy: Violin, Clarinet, Trumpet or Percussion 2
MUSC 570 Instrumental Ensemble Performance (Instrumental Major) 2
MUSC 579 Chamber Ensembles (Instrumental Major) 2
Vocal Pedagogy Specialization
Core Courses listed above 9
Pedagogy Courses
MUSC 551 Vocal Pedagogy I 3
MUSC 553 Vocal Pedagogy II 3
MUSC 590 Vocal Internship 1
Other Studies
MUSC 525 Vocal Literature 3
MUSC 596 Individual Lessons 4
MUSC 597 Special Projects (Pedagogy topic) 2
MUSC 997 Independent Study 2
Electives 5-10
MUSC 581 Graduate Opera Workshop 1
Total Credits 33-38
Music Composition Specialization

Core Courses listed above 9
MUSC 506  Advanced Composition 8
MUSC 537  Advanced Studies in Musical Form 2
MUSC 538  Advanced Orchestration 2
MUSC 539  Advanced Counterpoint 2
MUSC 593  Final Project in Composition 4
Electives 5-11
Total Credits 32-38

For those in the composition concentration, the final project in composition replaces an independent study.

Choral Conducting Specialization

Core Courses listed above 9
Conducting Courses
MUSC 561  Advanced Choral Conducting 2
MUSC 562  Advanced Instrumental Conducting 2
MUSC 595  Individual Lessons (Conducting) 2
MUSC 599  Graduate Recital (Conducting) 2
Other Studies
MUSC 524  Choral Literature 3
MUSC 551  Vocal Pedagogy I 3
MUSC 580  Choral Ensemble Performance 2
MUSC 594  Individual Lessons (Voice) 2
MUSC 997  Independent Study 2
Electives 3-9
Total Credits 32-38

Instrumental Conducting Specialization

Core Courses listed above 9
Conducting Courses
MUSC 561  Advanced Choral Conducting 2
MUSC 562  Advanced Instrumental Conducting 2
MUSC 595  Individual Lessons (Conducting) 2
MUSC 599  Graduate Recital (Conducting) 2
Other Studies
MUSC 521  Instrumental Literature 3
MUSC 570  Instrumental Ensemble Performance 2
MUSC 594  Individual Lessons (Instrumental) 2
MUSC 997  Independent Study 2
Electives 6-12
Total Credits 32-38

Collaborative Piano Specialization

Core Courses listed above 9
Other Courses
MUSC 511  Chamber Music Literature 3
MUSC 512  Diction for Singers 2
MUSC 525  Vocal Literature 3
MUSC 578  Seminar for Collaborative Piano 1
MUSC 579  Chamber Ensembles 2
MUSC 592  Individual Lessons: Collaborative Piano 8
MUSC 599  Graduate Recital 2
MUSC 997  Independent Study 2
Electives 0-6
Total Credits 32-38

Doctor of Philosophy (Ph.D.) Music Education

Admission Requirements

Admission requirements for the Doctor of Philosophy degree in Music Education are the same as those found under the Teaching and Learning Doctoral Program in Education and are listed below.

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Graduate grade point average(s) above 3.5.
2. Excellent writing skills.
3. Three references that speak to academic ability, professional accomplishments related to your field of study, and positive character traits.
4. A statement of clear professional goals that can be met by our program as specified in the graduate catalog.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Recommended: The Graduate Record General Examination (verbal, quantitative, analytical), the Advanced Graduate Record Examination, and/or the Miller Analogies Test.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Music Department.

Requirements for the Doctor of Philosophy Degree set forth by the Music Department include:

The Ph.D. program of study in Teaching and Learning shall include the following:

1. Completion of 90-96 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree (maximum of 30 semester credit hours) may be transferred from another institution that offers post-master’s degrees in the discipline.
4. At least one-half of the work must be in the major field, including:
   a. at least 10 credits of dissertation, which incorporates independent work that is an original contribution to knowledge in the field.
   b. A minimum of 6 credits in the Foundations of Education.
   c. A minimum of 12 credits of scholarly tools
5. At least 12 hours of a minor or cognate in a supporting area.
6. Meet one of the three residency options described below:

Residency Requirements

The purpose of residency is to provide an opportunity for sustained and concentrated intellectual effort, to provide for immersion in a research environment, and to permit extensive interaction with fellow students and faculty of the major department.

The residency for the Ph.D. in Music Education is designed to provide the student with the experiences outlined by the School of Graduate Studies. Students are expected to engage in serious scholarship and reflect on their learning and experiences, as well as to integrate their doctoral study such that the program of study they pursue will become a unified experience. A doctoral student in Music Education can meet the residency requirement in any one of the following ways:

1. Students will complete a residency while enrolled in a minimum of nine semester hours of credit during each of two consecutive semesters (Fall/Spring or Spring/Fall). Students in this option are encouraged, but are not required, to enroll in a Doctoral Seminar during their residency or at another time in the program. If a student is a GTA, GSA or GRA, the
number of credits that the student may take for this option is less and is
specified in the catalog.
2. Students will complete a residency while enrolled in a minimum of eight
semester hours of credit during each of three consecutive summer
sessions and in a minimum of two Doctoral Seminars following their first
and second or third summers in residence.
3. Students will complete a residency over a period of three consecutive years
of continuous enrollment in a minimum of 36 hours of credit (12 credits
per year for three years), to include a minimum of two Doctoral Seminars
during the period of residency.

Core Courses listed above 9

Music Education Component
MUSC 503  Psychological Foundations of Music Learning 3
MUSC 507  Foundations of Music Education 3
MUSC 599  Dissertation 10-15
Music Electives (other studies in Music) 7-23

Teaching & Learning Core (minimum of 12 credits)
T&L 539  College Teaching 3
T&L 545  Adult Learners 3
Teaching & Learning Core Electives (selected from T&L list in consultation
with adviser) 6

Foundations of Education
EFR 500  Introduction to the Foundations of Education 3
MUSC 503  Psychological Foundations of Music Learning (listed above) 3
MUSC 507  Foundations of Music Education (listed above) 3

Scholarly Tools in Education
(may serve as Research cognate, 3 options, see below) 12

Supporting Area and Electives
(may include Minor, 24 credits or Cognate, 12 credits) 21-26

Scholarly Tools Options (courses below or equivalents)
Option 1: Qualitative Emphasis Option
EFR 510  Qualitative Research Methods 3
EFR 520  Advanced Qualitative Research Methods 3
EFR 516  Statistics II 3
MUSC 598  Research in Music Education 3

Option 2: Quantitative Emphasis Option
EFR 510  Qualitative Research Methods 3
EFR 516  Statistics II 3
EFR 518  Multivariate Analysis 3
MUSC 598  Research in Music Education 3

Option 3: Tests and Measurements Option
EFR 511  Program Evaluation 3
EFR 512  Educational Tests and Measurements 3
EFR 516  Statistics II 3
MUSC 598  Research in Music Education 3

Courses

MUSC 500. Introduction to Graduate Study in Music. 3 Credits.
A course covering bibliography and methodology in the principal areas of
research in music.

MUSC 501. Graduate Music Theory Review. 3 Credits.
A comprehensive review of the harmonic, contrapuntal and formal elements of
music, designed to prepare students for graduate-level music courses. Does
not count toward fulfillment of the minimum 32 hours of the graduate music
degree requirements; may be waived by examination.

MUSC 502. Perspectives in Music Theory. 3 Credits.
The study of formal systems in music through selected musical works.
Prerequisites: MUSC 501 or passing grade on placement examination.

MUSC 503. Psychological Foundations of Music Learning. 3 Credits.
An in-depth study of the psychological processes of music learning.

MUSC 504. Seminar in Music. 1-4 Credits.
Seminars concerning various topics of interest to the faculty and students.

MUSC 505. Graduate Music History Review. 3 Credits.
An accelerated comprehensive review of western music history designed to
prepare students for other graduate-level music courses, emphasizing group
learning through individual preparation. Credit does not count toward fulfillment
of 32-hour minimum. Music graduate degree requirements. May be waived by
examination.

MUSC 506. Advanced Composition. 1-4 Credits.
The composition and performance of original works in selected instrumental
and vocal media. May be repeated without limitation. Repeatable.

MUSC 507. Foundations of Music Education. 3 Credits.
A comprehensive investigation of the historical, philosophical, and aesthetic
foundations of music including current trends in music education.

MUSC 508. Perspectives of Music History. 3 Credits.
A course on various topics on the history and literature of music and related
musical fields. This course may require preparation and delivery of a
substantial research paper on an appropriate topic. Repeatable when topics
vary. Prerequisites: MUSC 500 and MUSC 505, or passing grade on placement
examination, or instructor's permission. Repeatable.

MUSC 509. Trends in Music Education. 3 Credits.
An overview of historical and contemporary trends in music education.

MUSC 511. Chamber Music Literature. 3 Credits.
An historical overview of piano chamber music literature incorporating reading,
listening, score study and analysis.

MUSC 512. Diction for Singers. 1 Credit.
Rules for and practical application of two of the major languages used in art
song literature: Italian/English or French/German. May be repeated for credit up
to 2 hours. F.S.

MUSC 521. Instrumental Literature. 3 Credits.
The study of instrumental music literature through scores and recordings.

MUSC 522. Solo Instrumental Literature: Violin, Clarinet, Trumpet or
Percussion. 2 Credits.
Study of solo and chamber music literature for the specified instrument through
scores and recordings.

MUSC 523. Keyboard Literature. 2-3 Credits.
This course is designed to introduce pianists to the keyboard literature from
pre-Baroque to present day. On demand.

MUSC 524. Choral Literature. 3 Credits.
The study of choral literature through scores and recordings.

MUSC 525. Vocal Literature. 3 Credits.
An historical overview of the development of art song and opera including
reading, listening, score study and analysis. F. odd years.

MUSC 537. Advanced Studies in Musical Form. 2 Credits.
Advanced study and analysis of the principal forms of musical composition.
Prerequisite: Graduate status.

MUSC 538. Advanced Orchestration. 2 Credits.
Advanced study of orchestration and arranging techniques for various
ensembles and combinations of instruments. Includes the study of exotic
instruments. Prerequisite: Graduate status.

MUSC 539. Advanced Counterpoint. 2 Credits.
Advanced study of Counterpoint. Topics may include 16th-century styles, 18th-
century styles, and/or 20th-century styles. The course includes both analysis
of existing works, and composition of original works. Prerequisite: Graduate
status.

MUSC 551. Vocal Pedagogy I. 3 Credits.
Teaching procedures, methods, and literature for teaching voice students from
beginning through early intermediate levels, addressing questions of style,
performance practices, editions, and techniques. Includes observation and
teaching in both group and individual settings.

MUSC 552. Keyboard Pedagogy I. 2-3 Credits.
This course is designed to introduce pianists to the art of teaching through
discussions, lectures, and assignments which explore teaching techniques,
materials, and methods appropriate for the beginning and elementary piano
student. On demand.
MUSC 553. Vocal Pedagogy II. 3 Credits.
Teaching procedures, methods, and literature for teaching voice students from the late intermediate through advanced levels, addressing questions of style, performance practices, editions, and techniques. Includes observation and teaching in both group and individual settings. Prerequisite: MUSC 551.

MUSC 555. Instrumental Pedagogy: Violin, Clarinet, Trumpet or Percussion. 2 Credits.
Teaching procedures, methods and literature for teaching students of the specified instrument, addressing questions of style, performance practices, techniques, and editions.

MUSC 561. Advanced Choral Conducting. 2 Credits.
Choral schools and composers since the sixteenth century, study of interpretations based on scores, recordings, and class performance.

MUSC 562. Advanced Instrumental Conducting. 2 Credits.
Advanced techniques of instrumental conducting and score reading.

MUSC 570. Instrumental Ensemble Performance. 1 Credit.
Repeatable to 2 credits for Music Education students. For others, repeatable without limitation. Repeatable to 20 credits.

MUSC 578. Seminar for Collaborative Piano. 1 Credit.
Seminar for the application of collaborative piano techniques. May be repeated for credit up to 2 hours. F.S.

MUSC 579. Chamber Ensembles. 1 Credit.
Exploration of chamber music works and cultivation of its advanced techniques. The student's progress is evaluated through final jury performance or public performance. Repeatable without limitation. Repeatable. F.S.

MUSC 580. Choral Ensemble Performance. 1 Credit.
Repeatable to 2 credits for Music Education students. For others, repeatable without limitation. Repeatable to 20 credits.

MUSC 581. Graduate Opera Workshop. 1 Credit.
Graduate level staged performance of operatic literature: chamber operas, scenes from larger works, and major productions. Prerequisite: Permission of the instructor. Corequisite: Enrollment in graduate level voice lessons. Repeatable. S.

MUSC 590. Vocal Internship. 1 Credit.
Teaching of group and individual voice under the supervision and critique of voice faculty. Repeatable up to two (2) credits. Prerequisite: MUSC 551.

MUSC 592. Individual Lessons: Collaborative Piano. 2 Credits.
Individual lessons for the collaborative piano major to broaden knowledge of collaborative repertoire, develop sight-reading proficiency, and strengthen accompanying skills. Public performance is a prominent grading component. Repeatable. F.S.

MUSC 593. Final Project in Composition. 4 Credits.
The composition and performance of an original musical work of proportions suitable for a final composition project at the master's level.

MUSC 594. Individual Lessons. 1 Credit.
Individual lessons in secondary instruments, conducting or voice. In registering for private lessons in voice, piano, organ, conducting or any orchestral instrument, "Voice" or the name of the instrument serves as the title of the course. For the final examination (excluding conducting), the student will perform before a faculty committee. May be repeated for credit without limitation. Repeatable.

MUSC 595. Individual Lessons. 1-2 Credits.
Individual lessons in the major instrument for non-performance music degree programs. In registering for private lessons, "Voice" or the name of the instrument serves as the title of the course. For the final examination (excluding conducting), the student will perform before a faculty committee. May be repeated for credit without limitation. Prerequisite: Permission of the Instructor. Repeatable. F.S.

MUSC 596. Individual Lessons. 1-4 Credits.
Individual lessons in the major instrument for the performance major. In registering for private lessons, "Voice" or the name of the instrument serves as the title of the course. For the final examination, the student will perform before a faculty committee. May be repeated for credit without limitation. Prerequisite: Permission of Instructor. Repeatable. F.S.

MUSC 597. Special Projects. 1-3 Credits.
Individual study in an approved area of interest to the student. Repeatable to 30 credits.

MUSC 598. Research in Music Education. 3 Credits.
An introduction to qualitative and quantitative research methodology relative to music education.

MUSC 599. Graduate Recital. 2 Credits.
The presentation of a graduate recital. Recitals may not be given until a recital audition has been reviewed and approved by the applied instructor and the student's master's committee. Music Education students must also complete an associated document. Repeatable to 4 credits. Prerequisite: Consent of instructor. Corequisites: MUSC 595 or MUSC 596. Repeatable to 4 credits. F.S.

MUSC 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

MUSC 997. Independent Study. 2 Credits.
Independent study and preparation of a written document. Prerequisite: Permission of advisor.

MUSC 998. Thesis. 4 Credits.
Prerequisite: Permission of advisor.

MUSC 999. Dissertation. 1-15 Credits.
Prerequisite: Permission of advisor. Repeatable to 15 credits.

Nursing
http://www.nursing.und.edu/

FACULTY: Adams, Anderson, Bartz, Buettner, El-Masri, Evanson, Poland, Hanson, Harsell, Heintz, Hendricks, Higgenston, Jahn, Johnson, Kaiser, Lindseth, Proebstle, Ralph, Rittenbach, Roberts, Roux, Rust, Semmens, Shanta, Shogren, Sikkema, Sperle, Wolf, Wright, Zwilling

Degrees Granted: Master of Science (M.S.), Doctor of Philosophy (Ph.D.), and Doctor of Nursing Practice (DNP)

The College of Nursing and Professional Disciplines offers graduate programs leading to a Master of Science (M.S.) degree with a major in nursing, a Ph.D in nursing or a Doctor of Nursing Practice. Information on any newly approved programs of study will be available on the College of Nursing and Professional Disciplines website at: www.nursing.und.edu/.

The Master of Science degree with a major in nursing is targeted to prepare advanced practice nurses in areas of clinical specialization, nurse educators, and to expand the scientific knowledge for nursing practice through research. The graduate program is accredited by the Commission on Collegiate Nursing Education (CCNE). The course of study for Nurse Anesthesia is accredited by the Council on Accreditation (COA) of Nurse Anesthesia Education Programs.

The Master of Science program currently offers six areas of specialization:
1. Family Nurse Practitioner
2. Adult Gerontological Primary Care Nurse Practitioner
3. Psychiatric Mental Health Nurse Practitioner
4. Nurse Anesthesia
5. Nurse Educator

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section. However, nursing degree content and nursing admission requirements are subject to change. Please see our nursing website at the following link for the most current information. http://nursing.und.edu/departments/nursing/graduate.cfm

Master of Science (M.S.)

Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science degree with a major in Nursing include:
1. At the time of application, a baccalaureate degree in nursing from
an NLNAC or CCNE accredited program. (Foreign schools will be evaluated
on an individual basis.)
2. A minimum GPA of 3.00 for the last two years of baccalaureate nursing
study.
3. An undergraduate or graduate course in statistics.
5. One year of experience as a registered nurse (preferred).
6. Meet current health and immunization requirements of the College of
Nursing and Professional Disciplines.
7. Submit to and satisfactorily complete a background check and drug test
prior to admission.
8. Satisfy the School of Graduate Studies' English Language Proficiency
requirements as published in the graduate catalog.
9. Applications must be received by track specific date (please see track
website for additional information).
10. Current resume or CV.
12. Three letters of recommendation (form) or reference letters.
13. Official transcripts from every educational institution attended or currently
attending (even if those grades are shown on another transcript).
14. Additional requirements for Nurse Anesthesia are a minimum GPA of at
least a 3.00 in all years of study at the undergraduate nursing level, and a
minimum GPA of 3.00 in undergraduate science coursework, an upper
division course in biochemistry (or equivalent), an undergraduate college
algebra course (equivalent or higher), one year of full-time critical care
nursing experience (two years are preferred), and a successful interview.

Non-degree seeking students

Upon approval, up to 9 non-degree credits may be applied to a graduate
nursing track if admitted. Contact Nursing Office of Student Services for
additional information at 701-777-4174.

Doctor of Nursing Practice (DNP)

Admission Requirements

The applicant must meet the Graduate School's current minimum general
admission requirements as published in the Graduate Catalog. Admission
requirements for the Doctor of Nursing Practice include:
1. Completion of a Master’s degree or higher from a nursing program of study
accredited by the Commission of Collegiate Nursing Education (CCNE) or
the National League of Nursing Accrediting Commission (NLNAC).
2. Current licensure unencumbered and in good standing as a Registered
Nurse with certification as a Nurse Practitioner, Clinical Nurse Specialist,
Nurse Anesthetist or Nurse Midwife.
3. A minimum Grade Point Average of 3.0. Priority will be given to those
applicants with a cumulative GPA of 3.5 or greater in graduate coursework.
4. Graduate level statistics course completed within the five years prior to
admission.
5. A two page narrative stating the applicant’s professional goals for DNP
education and describing how the DNP will contribute to those goals. The
narrative should propose a clinical interest or practice problem topic for
the applicant’s scholarly DNP project, with a scope that would yield a
result such as a system-wide change at the organizational, regional, or
national level; a new/revised state health policy; or the implementation
of significant new services to a population or geographic region. This
narrative will provide insight to the admissions committee on the applicant’s
professional goals and expectations, determine whether the applicant’s
topic corresponds to existing faculty expertise, and assess written
communication skills.
6. Three letters of recommendation, one of which must be from a graduate-
prepared nurse or faculty member. Letters should speak to applicant’s
ability to be successful in the DNP, addressing items such as clinical skills,
critical thinking, independent decision making, and collaborative skills with
other health professionals, nursing leadership, etc.
7. Resume or curriculum vitae.
8. Satisfy the School of Graduate Studies’ English Language Proficiency
requirements as published in the graduate catalog.
9. Interview may be required.
10. Background check from the CNPD approved vendor with satisfactory
results prior to admission.

Degree Requirements

Students seeking the Doctor of Nursing Practice degree at the University of
North Dakota must satisfy all general requirements set forth by the Graduate
School as well as particular requirements set forth by the Nursing Department.
The DNP nursing courses are offered online.
1. Completion of all course work with GPA of at least 3.0.
2. Satisfactory completion of at least 500 hours of advanced practice
internship hours.
3. Satisfactory completion of an evidence based clinical project that informs
practice.
4. Presentation of the evidence based practice project in a regional, national
or international advance practice forum or conference.
5. Submission of final report of project for publication.
7. Required Courses:
   - NURS 503 The Business of Practice 2
   - NURS 512 DNP Core Concepts I 2
   - NURS 513 DNP Core Concepts II 2
   - NURS 519 Practice Leadership 2
   - NURS 522 Health Informatics 3
   - NURS 582 Health Policy 2
   - NURS 593 DNP Internship I 4
   - NURS 594 DNP Internship II 4
   - NURS 595 DNP Internship III 4
   - NURS 596 DNP Capstone 2
   - NURS 598 Evidence Based Research I 3
   - NURS 599 Evidence-Based Research II 3

Intensives

Students are required to attend an on-campus intensive experience one
weekend per semester for purposes of professional mentoring, learning,
networking, and enhancing skill development.

Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum
general admission requirements as published in the graduate catalog.
1. Completion of a bachelor’s or higher degree in nursing from a nationally
accredited program or equivalent nursing preparation.
2. A cumulative Grade Point Average (GPA) of at least 3.0 for all
undergraduate Nursing work and a GPA of at least 3.0 for the junior and
senior years of undergraduate Nursing work (based on A=4.0).
3. A cumulative GPA of 3.5 or above in graduate Nursing coursework.
4. Graduate Record Examination or Miller’s Analogy Test scores within past
five years.
5. Completion of a graduate level univariate statistics course.
6. Completion of a master’s level Nursing Theory course.
7. A one or two page paper stating the applicant’s research interests and
professional goals.
8. Evidence of current, unencumbered U.S. licensure to practice as a
registered nurse.
10. Resumé or CV.
11. Satisfy the Graduate School’s English Language Proficiency requirements
as published in the graduate catalog.
12. An interview will be required for applicants meeting these basic admission
requirements.
13. Submit to and satisfactorily complete a background check prior to admission.
14. Applications must be received by program specific date (please see program website for additional information).

Note: Applicants with earned master’s degrees from accredited schools may qualify for up to 30 hours of credit toward the doctoral degree. Credit will be awarded only for courses in which a grade of B or better has been achieved.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Nursing Department. The PhD nursing courses are offered online with synchronous and asynchronous delivery.

Ph.D. students will be required to develop and submit a nationally competitive grant to support their doctoral research.

Ph.D. students are required to submit an article for publication to a refereed journal and to present dissertation work to a regional or national audience.

Ph.D. students are required to participate in scholarly seminars on research, research ethics and writing for publication.

1. Students must complete a minimum of 90 semester credits of post-baccalaureate work, including an original dissertation.

2. **Required Courses:**

   **Research (12-18 credit hours)**
   - NURS 573 Research Funding 3
   - NURS 574 Quantitative Nursing Methods 3
   - NURS 575 Qualitative Nursing Research 3
   - NURS 580 Research Practicum 1-6

   **Nursing Science (12-18 credit hours)**
   - Pre-requisite Masters level Nursing Theory course
   - NURS 557 Foundations of Nursing Science 3
   - NURS 558 Research Design 3
   - NURS 573 Quantitative Nursing Methods 3
   - NURS 575 Qualitative Nursing Research 3
   - NURS 580 Research Practicum 1-6

   **Scholarly Tools (9-12 credit hours)**
   - Pre-requisite Univariate Statistics
   - NURS 514 Essentials in Epidemiology 3
   - NURS 522 Health Informatics 3
   - NURS 525 Applied Multivariate Statistics 3

   **Functional Component (9-12 credit hours)**
   - NURS 509 Foundations for Nurse Education 3
   - NURS 558 Research Design 3
   - NURS 581 The Nurse Scientist 3

   **Electives (12-30 credit hours)**
   Courses will be selected by the student in consultation with the student's faculty advisory committee to develop the particular research thrust of the student.

   **Dissertation (18 credit hours), including**
   - NURS 579 Dissertation Seminar (three 1-credit hour courses) 1
   - NURS 999 Dissertation (15 credit hours total required) 1-15

   **Total Credits** 90

3. **Comprehensive Examinations:** Students must successfully complete a written and oral comprehensive examination prior to advancement to candidacy and approval of the dissertation proposal. The student’s Program of Study Form, Dissertation Committee Form, and all course work (excluding dissertation credits) must be completed before applying to the School of Graduate Studies to take the Comprehensive Examination.

4. **Final Examination:** A final examination will be scheduled and administered according to the rules of the graduate school.

5. All doctoral nursing courses taken at the University of North Dakota College of Nursing and Professional Disciplines must be completed with a grade of “B” or better. An individual course may not be taken more than twice.

6. Various nursing courses are offered by semester - not all courses are offered every semester.

**Residency**

There is no residency requirement; however, students are required to attend two “Intensive experiences” per year. The Intensive experience (3-5 days) will gather students and faculty on the UND campus or at a regional nursing research conference for purposes of scholarship, networking, and education.

**Transfer Credits**

A maximum of 30 semester credits may be transferred from a master’s program. All nursing courses that are transferred and become part of the student’s doctoral program of study must be achieved with a grade of “B” or better.

A maximum of 24 semester credits may be transferred for postmaster’s coursework.

**Courses**

**NURS 500. Theories/Concepts Nursing. 3 Credits.**

The focus of this core course is on analysis of current nursing and related theories and concepts which guide clinical practice, curriculum development, research, and nursing administration.

**NURS 502. Evidence for Practice. 3 Credits.**

This course emphasizes the application of basic research concepts to the building of evidence-based practice in nursing. Advanced competencies are developed in searching and evaluating the literature, examining the merit of different types and levels of evidence, and analyzing the generalizability and implications for clinical practice. Prerequisites or Corequisites: Admission to one of the Graduate Nursing Tracks, NURS 500 and statistics and/or permission of instructor. F,S.

**NURS 503. The Business of Practice. 2 Credits.**

This course focuses on the business aspects of Inter-professional advanced practice in the complex health care environment. Prerequisite: Admission to the DNP Program.

**NURS 504. Advanced Pharmacology I. 3 Credits.**

Pharmacodynamic and pharmacokinetic principles with a focus on clinical anesthesia practice. Physiologic systems and drug classifications are used; emphasis on therapeutic use, side effects, drug interactions, and contraindications of drugs used for intravenous anesthesia induction, inhalation, and balanced anesthesia maintenance. Pediatric and geriatric variations will be addressed. Prerequisite: Admission to Nurse Anesthesia Specialization.

**NURS 506. Advanced Pharmacology II. 3 Credits.**

Advanced pharmacology for clinical nurse anesthesia practice. Prerequisite: NURS 504.

**NURS 507.* Anesthesia Seminar and Clinical Practicum. 4 Credits.**

This course is designed to provide nurse anesthesia students an overview of the basic principles and skills needed to care for the routine surgical patient. Topics include difficult airway management, patient monitoring, patient preparation, positioning, patient safety, fluid and electrolyte management, documentation of anesthesia care, and an introduction to regional anesthesia. Analysis, integration, and utilization of research to improve practice is emphasized. The lecture content is reinforced through Clinical Simulation and laboratory experiences, allowing for immediate application of the lecture content and integration into the clinical setting. Students are introduced to the clinical setting through observational and hands-on experiences. Includes a clinical and/or laboratory component. Prerequisite: NURS 521.

**NURS 508. Nurse Anesthesia Review Course. 1 Credit.**

This course is faculty guided and designed to assist students with their review of nurse anesthesia course and clinical material in preparation for the CCNA certification examination. Prerequisite: Completion of all Nurse Anesthesia Specialization coursework.
NURS 509. Foundations for Nurse Education. 3 Credits.
This course begins to compare and contrast multiple roles and responsibilities of nurse educators in various settings in academic and health service. It will build the conceptual foundation for educational processes with emphasis on ethics, learning theories, taxonomies of learning and current evidence necessary for development of competencies necessary for the practice of educating. Students will begin to formulate their individual philosophy of teaching and learning. Prerequisite: Admission to the Nursing Graduate Program or consent of the instructor. Prerequisite or Corequisite: NURS 500. S.

NURS 510. Adv Physiology/Pathophysiology I. 3 Credits.
Normal physiologic functions associated with cellular structure and environment. Physiologic and pathophysiologic functions of the human body and its organ systems, both separately and integrated in whole activities. Prerequisite: Admissions to graduate study.

NURS 511. Adv Physiology/Pathophys II. 3 Credits.
Physiologic and pathophysiologic functions of the human body and its organ systems, both separately and integrated in whole activities. Prerequisite: NURS 510 or consent of instructor.

NURS 512. DNP Core Concepts I. 2 Credits.
This course is an exploration of the core concepts that support the developing role of the DNP as a practice focused leader and researcher. Prerequisite: Admission to the DNP Program.

NURS 513. DNP Core Concepts II. 2 Credits.
This course focuses on the concepts that support the development of the role of the DNP practice leader in the care of rural and vulnerable populations and issues related to planning and providing care for vulnerable and underserved populations. The primary concept focus areas are epidemiology and vulnerability related to population and individual health. Prerequisites: Admission to the DNP Program and NURS 512. S.

NURS 514. Essentials in Epidemiology. 3 Credits.
This course will emphasize the application of the principles of epidemiology as applied to the investigation and prevention of individual and population health problems. Students will evaluate care delivery models and analyze epidemiological data to develop and apply strategies for health promotion and disease prevention for individuals, aggregates, and populations. The core competencies will focus not only on the practice of public health, but also enhance practice for the clinician. Prerequisite: Admission to the Graduate School, MPH Program, or permission of the instructor. F,S.

NURS 517* Anesthesia Seminar and Clinical Practicum II. 5 Credits.
This course builds on the foundations learned in the prerequisite course. Advanced anesthesia principles are applied to various patient populations including the surgical patient with cardiovascular and respiratory diseases. Anesthesia care of other surgical populations including the trauma, orthopedic, urological, vascular, intra-abdominal and ENT patient will be explored. Important concepts include anatomical, physiological and pathophysiological, and pharmacological principles. Analysis, integration, and utilization of research to improve practice is emphasized. The lecture content is reinforced through simulated laboratory experiences, allowing for immediate application of the lecture content and integration into the clinical setting. A clinical rotation is included. Prerequisite: NURS 507.

NURS 518. Practice Leadership. 2 Credits.
This course focuses on practice leadership theories and strategies related to the role of the DNP advanced practice nurse within the complex health care system. Prerequisite: Admission to DNP Program or consent of instructor.

NURS 520. Prof Role Dvlpmnt/Nurse Ansthsia. 3 Credits.
The focus of this course is on the identification and analysis of the professional components of nurse anesthesia practice, emphasizing role development; management and leadership; medical, ethical and legal responsibilities; the provision of culturally competent care; and scope of professional practice. Other areas that will be explored include quality improvement, the legislative process, credentialing, professional organizations, conflict resolution, and self-care and stress management for the anesthetist. An in-depth analysis of current trends and issues affecting healthcare and the delivery of anesthesia services are included in the course content. Prerequisites: NURS 521 and NURS 507. Corequisite: NURS 517.

NURS 521. Foundations of Anesthesia Practice. 3 Credits.
This course provides the foundation for nurse anesthesia practice. Lecture and discussion begin with an analysis of the history of anesthesia nursing, professionalism, and standards of care for the anesthetist. Safety in the nurse anesthesia environment will be emphasized. Additional content includes the applied chemical, physical, and biochemical concepts as they relate to anesthesia practice, including the mechanisms of anesthesia, medical mathematics, medical gas systems, laws governing gases, the anesthesia machine, monitoring principles and equipment, airway equipment and basic airway management, and universal precautions. Prerequisite: Admission to the Nurse Anesthesia Specialization.

NURS 522. Health Informatics. 3 Credits.
This course prepares the health care practice professional to use and evaluate emerging health care technology and data systems to support evidence-based practice. Prerequisite: Admission to DNP Program or consent of instructor.

NURS 523* Health Promotion. 3 Credits.
Paradigms in health promotion, health detection, and disease prevention across the lifespan are used in synthesis in theory and evidence-based primary care interventions. A clinical laboratory component is included. Prerequisite: Admission to the Nursing Graduate Program or consent of the instructor. Prerequisite or corequisite: NURS 514. S.

NURS 525. Applied Multivariate Statistics. 3 Credits.
Principles, assumptions and applications of major multivariate statistical techniques commonly used in nursing and clinical health research. Prerequisite: Graduate level univariate statistics and admission to the Nursing Doctoral Program or consent of the instructor. F.

NURS 526. Ethical, Legal and Health Policy Issues. 3 Credits.
This course emphasizes health policy issues within the context of legal and ethical concepts. Students will examine and debate health policies in current practice, thus broadening their ability to analyze, implement, and evaluate health policy issues.

NURS 527* Anesthesia Seminar and Clinical Practicum III. 5 Credits.
This course further builds on the foundations learned in prerequisite courses. Students will incorporate previously learned anatomy, physiology, pathophysiology, and patient management into the care of subspecialty patients and patients with complex co-existing diseases. Advanced anesthesia principles are applied to the OB, pediatric, geriatric, and neuro patient. The pharmacology and anesthesia management of these subspecialty populations and patients with various disease states, such as kidney, musculoskeletal, and endocrine disorders, will be explored. Analysis, integration, and utilization of research to improve clinical practice is emphasized. The lecture content is reinforced with a clinical experience that emphasizes anesthesia care for subspecialty populations. A clinical/laboratory component is included. Prerequisite: NURS 517.

NURS 530. Research Design & Methods in Nursing. 3 Credits.
Prerequisite or corequisite: NURS 500 or consent of instructor.

NURS 531. Adult-Gerontology Illness Management I. 3 Credits.
This is the first of a two-course sequence that focuses on evidenced-based primary care diagnosis and management of common episodic/chronic problems encountered by young adults, adults and older adults and their social network in ambulatory, inpatient, and community settings. Physiological, psychosocial, and pharmacological interventions are integrated into the holistic care that incorporates age-related, cultural, family, and community variations. An on-campus intensive is required for this course. Prerequisites: NURS 511 and NURS 585. Corequisite: NURS 597. F.

NURS 532. Family Nursing. 3 Credits.
Theoretical and scientific foundations for advanced practice nursing care for the family-as-a-unit in health and illness across the lifespan.

NURS 533. Adult-Gerontology Illness Management II. 3 Credits.
This is the second of a two-course sequence that focuses on evidenced-based primary care diagnosis and management of common episodic/chronic problems encountered by young adults, adults and older adults and their social network in ambulatory, inpatient, and community settings. Physiological, psychosocial, and pharmacological interventions are integrated into the holistic care that incorporates age-related, cultural, family, and community variations. An on-campus intensive is required for this course. Prerequisite: NURS 531. Corequisite: NURS 597. S.
NURS 535. Advanced Pharmacology for Primary Care I. 2 Credits.
Pharmacological agents utilized to treat common acute and chronic health problems are explored in depth. The course focus is on advanced nurse practice roles related to prescription, pharmacological, and therapeutic applications of the drugs. Prerequisite: Admission to the Nursing Graduate Program or consent of the instructor. Prerequisite or corequisite: NURS 510. F.S.

NURS 537. Graduate Cooperative Education. 1-2 Credits.
The course focus is upon experience in advanced nursing practice integrating theory, research, and advanced practice in a specific area of nursing. Course overview: the purpose of this course is to provide the graduate nursing student with advanced nursing practice as an employee in a health care agency and to evaluate that experience in relation to the educational program. A clinical/laboratory component is included. Prerequisite: Permission of Graduate Director of Nursing. Repeatable to 9 credits.

NURS 538. Psych Diagnostic Reasoning. 2 Credits.
This course prepares students for advanced therapeutic communication, interviewing, and assessment of people with mental illness across the life span. Skills are developed in differential diagnoses of psychopathology within the scope and standards of advanced psychiatric mental health nursing practice. Clinical application is included. Prerequisite: Acceptance into the PMHNP program or permission of instructor. S.

NURS 539. Advanced Pharmacology for Primary Care II. 2 Credits.
Pharmacological agents utilized to treat common acute and chronic health problems are explored in depth. The course focus is on advanced nurse practice roles related to prescription, pharmacological, and therapeutic applications of the drugs. Prerequisite: Admission to nursing graduate program and NURS 535 or consent of instructor. F.S.

NURS 546. Advanced PHN I. 4 Credits.
NURS 546 introduces foundational concepts of advanced PHN practice and population health. Corequisite: NURS 547.

NURS 547. Advanced PHN Practicum I. 4 Credits.
The focus of this course is on application of foundational concepts of Advanced PHN practice. Students will conduct a community assessment and identify community problems and strengths. Written and oral communication skills are emphasized. Corequisite: NURS 546.

NURS 548. Advanced PHN II. 3 Credits.
This course focuses on the leadership role of advanced PHN practice. Public health and community-based organizational assessment, program monitoring and evaluation, quality improvement, and management of multiple projects are emphasized. Concepts of leadership in public and community health and collaborative interdisciplinary practice are discussed. Health policy and law and ethics as they relate to public health are explored. In addition, advanced PHN leadership in rural areas and in disaster/emergency preparedness and management are discussed. Prerequisites: NURS 502, NURS 546, and NURS 547. Corequisite: NURS 549.

NURS 549. Advanced PHN Practicum II. 3 Credits.
This course focuses on implementation of advanced PHN interventions. Corequisite: NURS 548.

NURS 550. Global Public Health Issues. 2 Credits.
This course focuses on population health issues at a global level. Differences in population health status between developing and developed countries are explored. Special emphasis is placed on war as a public health issue and the global impact of AIDS.

NURS 552. Role Development of the CNS. 2 Credits.
Students will compare and contrast the various roles of the clinical nurse specialist and evaluate those roles as they relate to their individual area of practice. Concepts of professional development are emphasized. Prerequisite: NURS 502.

NURS 553. Role Development of the NP. 2 Credits.
This course emphasizes professional role development of the nurse practitioner. Students will compare and contrast the various roles of the nurse practitioner and evaluate those roles as they relate to the student's individual planned area of practice. Prerequisite: NURS 502.

NURS 557. Foundations of Nursing Science. 3 Credits.
The epistemology and philosophy of nursing as an art and a science are examined. Patterns of knowing as well as clinical, conceptual, and empirical types of nursing knowledge will be discussed. The development of theory as a knowledge claim is analyzed. Prerequisites: Masters Level Nursing Theory Course and Admission to PhD Program. S.

NURS 558. Research Design. 3 Credits.
This course prepares the doctoral student to understand the link between research design and the study purpose. Prerequisite: Admission to PhD program or consent of instructor. F.

NURS 559. Maternal and Child Health in Primary Care. 2 Credits.
This course focuses on advanced practice nursing care of obstetric and pediatric clients within a primary care setting. An on-campus intensive is required for this course. Prerequisites: Admission to FNP, NURS 510, NURS 511, NURS 523, and NURS 585. SS.

NURS 564. Psychopharmacology. 2 Credits.
This course provides the advanced practice student with knowledge in the pharmacology of psychopathology across the life span. Emphasis will be placed on the appropriate use of pharmaceuticals for psychiatric disabilities/disorders including: Mood disorders, development disorders, psychotic disorders, anxiety disorders, dementia, and substance abuse. Prerequisite: Admission to PMHNP program or permission of instructor. S.

NURS 565. Rural Populations and Rural Health. 3 Credits.
This course provides an overview of characteristics of rural populations and rural health. Factors that contribute to health, morbidity, and mortality are examined, and the compounded vulnerability of rurality and disadvantaged groups is analyzed. Prerequisite: A graduate level Epidemiology course or permission of instructor. S.

NURS 566. Curriculum Development. 3 Credits.
This course focuses on the curriculum development process. Societal, professional, and institutional factors as well as current research findings influencing the curriculum development process are analyzed. Consideration of the impact of adult learning principles, workforce issues, legal-ethical concerns, and diverse student populations in regard to the curriculum development process is given. Prerequisite: NURS 509.

NURS 567. Teaching Methodologies. 3 Credits.
The course explores theory-based teaching strategies designed to develop cognitive abilities, psychomotor skills, and affective qualities in learners from diverse backgrounds. Strategies and methods for the teaching of nursing content in a variety of settings are utilized. The use of technological tools in nursing education is evaluated. Prerequisite or corequisite: NURS 566.

NURS 568. Teaching Practicum. 2 Credits.
Students assume the role of the nurse educator in selected learning settings under the guidance of a preceptor. A clinical/laboratory component is included. Prerequisites: NURS 566 and NURS 567 and NURS 569, or consent of instructor.

NURS 569. Assessment and Evaluation. 3 Credits.
Principles of assessment, measurement, and evaluation are analyzed in this course as they relate to nursing education. The processes of assessing student learning, teaching, and program outcomes are explored. Topics relevant to the evaluation of individual student learning such as test development, evaluation of critical thinking, and clinical evaluation are included. The processes of faculty and program evaluation are examined. Prerequisites: NURS 566 and NURS 567, or consent of instructor.

NURS 572. Diverse Vulnerable Populations. 3 Credits.
Students will explore a wide range of concepts as they apply to diverse and vulnerable populations. The focus of the course is on understanding concepts and principles important to nursing when doing research, planning health care, developing health policy, and teaching in this area. Prerequisite: Admission to the Nursing Graduate Program or consent of the instructor.

NURS 573. Research Funding. 3 Credits.
This course integrates the scientific and practical aspects of professional writing and grant proposal development to obtain funds for research. Prerequisite: Admission to the graduate nursing program or approval of instructor. Prerequisite or Corequisite: NURS 574 and/or NURS 575; Non-nursing programs: Graduate level quantitative and/or qualitative research methods coursework required. F.

NURS 574. Quantitative Nursing Methods. 3 Credits.
The purpose of this course is to acquire knowledge and skills necessary to apply quantitative research methods in nursing. The course includes substantial applications of established methodologies and effective research techniques within the quantitative paradigm. Prerequisite: Admission to the doctoral program and completion of a multivariate statistics course. S.
NURS 575. Qualitative Nursing Research. 3 Credits.
This course focuses on examination and analysis of qualitative research designs with particular emphasis on approaches relevant to phenomena in nursing. Students will conduct fieldwork to develop some beginning qualitative research skills. Prerequisite or Corequisite: Admission to Doctoral Program or consent of instructor. F.

NURS 577. Rural Healthcare Ethics. 3 Credits.
This course is directed toward the development of critical dialogue and leadership strategies for dealing with ethical issues related to nursing, health care and research. Commitment to discussion, understanding and acceptance of the rights of others in dilemmas is emphasized. Reflexive nursing, which brings attention to one’s own position and objectivity, is encouraged. The challenges of ethics in rural milieus are included in the discourse. Prerequisite: Admission to the Nursing doctoral Program or consent of the instructor. S.

NURS 578. Doctoral Seminar. 1 Credit.
Prerequisite: Admission to the Nursing doctoral Program or consent of the instructor.

NURS 579. Dissertation Seminar. 1 Credit.
A series of presentations and discussions of doctoral student research, literature reviews, and current issues in nursing is presented in a seminar format. Prerequisite: Advancement to doctoral candidacy. Repeatable to 9 credits. S/U grading. F.S.SS.

NURS 580. Research Practicum. 1-6 Credits.
The doctoral research practicum provides a research experience for doctoral nursing students separate from the dissertation to participate in the research process under the guidance of an experienced/funded investigator. Experiences may include grant writing, data collection, analysis, and manuscript writing. Repeatable to 6 credits. F.S.SS.

NURS 581. The Nurse Scientist. 3 Credits.
This course prepares the doctoral student to actively engage in doctoral study with knowledge of the discipline of nursing and skills that facilitate success as an emerging nurse scientist. Prerequisite: Admission to PhD program. F.

NURS 582. Health Policy. 2 Credits.
This course will prepare the health care professional to understand and apply knowledge of health policy to function as an advocate for populations and individuals. Prerequisite: Admission to the DNP Program or consent of instructor.

NURS 583. Individual Therapy. 2 Credits.
This course provides knowledge and skill development in the implementation of evidence-based clinical therapies and treatments focused on the individual including cultural variations. Includes clinical practice. Prerequisites or corequisites: NURS 500, NURS 502, NURS 510, NURS 511, NURS 514, NURS 523, NURS 535, NURS 538, NURS 539, and NURS 585.

NURS 584.* Group and Family Therapies. 3 Credits.
Evidence-based clinical interventions with diverse groups and families are presented. Opportunities for clinical implementation accompany the theoretical models. A clinical/laboratory component is included. Prerequisites or corequisites: NURS 538, NURS 583 and admission into Psychiatric Mental Health specialization or consent of instructor.

NURS 585.* Advanced Health Assessment. 3 Credits.
An evidenced-based approach will be used to present methodologies for graduate student performance on health histories, developmental assessments, and physical/psychosocial assessments of individuals. Communication and interviewing techniques for advanced nursing practice are applied. A clinical/laboratory component is included with variations for Family Nurse Practitioner, Psych/Mental Health, Adult-Gerontology, and Nurse Anesthesia students. An on-campus intensive is required for this course. Prerequisite: Completion of an undergraduate course in health assessment techniques or consent of instructor. Prerequisite or corequisite: NURS 510. F.S.

NURS 586. Rural Health Programs and Research. 3 Credits.
This course focuses on policies, programs and research related to rural health. Prerequisite: NURS 565 and NURS 558 or consent of instructor. F.

NURS 588. Management of Psychopathology I. 2 Credits.
The focus of this course is management of individuals, groups and families with or affected by psychopathology. Continuity of care across settings and community health are emphasized. Prerequisites or Corequisites: NURS 538, NURS 583 and NURS 584.

NURS 589. Management of Psychopathology II. 2 Credits.
A firm basis for entry level advanced practice psychiatric mental health nursing is established in this course. Management of psychopathological co-morbidities is emphasized. Prerequisites or Corequisites: NURS 538, NURS 583, NURS 584 and NURS 588 passed at a B level.

NURS 590. Directed Studies. 1-3 Credits.
Designed to meet the needs of individual and/or small groups of graduate students. The course content will be based on student interests and needs in conjunction with the faculty member’s area of specialization. Prerequisite: Consent of instructor. Repeatable.

NURS 591. Readings in Nursing. 1-3 Credits.
Readings in selected nursing/health care topics with written and/or oral reports. Prerequisite: Consent of instructor. Repeatable.

NURS 592. Advanced PHN Practicum III. 4 Credits.
This course provides a capstone experience in Advanced PHN practice. Students are expected to integrate knowledge from all of their previous coursework into an applied practicum experience in population health, to evaluate population health interventions and programs, and develop strategies for program funding. Prerequisites: NURS 548 and NURS 549.

NURS 593. DNP Internship I. 4 Credits.
This first DNP Internship course is designed to provide the DNP Advanced Practice Nurse (APN) student with opportunities to apply the concepts in the AACN DNA Essentials document in the practice environment. Students will also begin development of the DNA capstone project. Corequisite: NURS 598.

NURS 594. DNP Internship II. 4 Credits.
This course is designed to provide the DNP student with additional practice focused learning opportunities to apply the concepts in the AACN DNP Essentials document in the practice environment. The student will complete and disseminate findings from the capstone project. Prerequisite: NURS 593. Corequisite: NURS 599.

NURS 595. DNP Internship III. 4 Credits.
This course is designed to provide the DNP APN with additional practice focused learning opportunities to apply the concepts in the AACN DNP Essentials document in the practice environment. The student will complete the DNP capstone project and disseminate findings in presentations and publications. Prerequisites: NURS 593 and NURS 594. Corequisite: NURS 596.

NURS 596. DNP Capstone. 2 Credits.
The capstone course provides the DNP students an opportunity to develop skills in reporting and dissemination of practice focused research findings. There is a focus on writing for publication of practice focused research. Corequisite: NURS 595.

NURS 597.* Advanced Clinical Practicum. 1-12 Credits.
This clinical practicum course provides the student with the opportunity to obtain extended clinical experience in the area of specialization. The course focuses on the integration of theoretical knowledge into clinical practice. A clinical/laboratory component is included. Prerequisite: Completion of NURS 517 for Nurse Anesthesia specialization or completion of first year curriculum for the Family Nurse Practitioner, Psychiatric/Mental Health or Gerontology specializations. Repeatable. S/U grading.

NURS 598. Evidence Based Research I. 3 Credits.
This course focuses on the development of the practice scholar and includes content of research and program evaluation methods used to address practice problems and inform future evidence based practice. Corequisite: NURS 593.

NURS 599. Evidence-Based Research II. 3 Credits.
This course focuses on the continued development of the practice scholar and includes content of research and program evaluation methods and analysis used to address practice problems and inform future evidence based practice. Prerequisite: NURS 598. Corequisite: NURS 594.

NURS 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

NURS 997. Independent Study. 2 Credits.

NURS 998. Thesis. 1-4 Credits.
Repeatable to 4 credits.

NURS 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

* These courses include a clinical and/or laboratory component.
Nurse Anesthesia

Mission Statement
The mission of the College of Nursing and Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

The purpose of master’s education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.

Program Goals
1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.
2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.
3. Participate as members and leaders of interprofessional health care teams.
4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Master of Science (M.S.)
Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science degree with a major in Nursing include:

1. At the time of application, a baccalaureate degree in nursing from an NLNAC or CCNE accredited nursing program. (Foreign schools will be evaluated on an individual basis.)
2. A minimum GPA of at least 3.00 for the last two years of the baccalaureate nursing study, a minimum GPA of at least a 3.00 in all years of study at the undergraduate nursing level, and a minimum GPA of 3.00 in undergraduate science coursework.
3. An undergraduate or graduate course in statistics.
4. Undergraduate course in College Algebra (UND math placement testing or an ACT score of 26+ on the math portion may be used to waive this requirement).
6. A minimum of one year full-time experience (two or more years preferred) as a registered nurse in a critical care setting. Desired settings would include medical, surgical, cardiovascular, neurologic, or trauma intensive care units and primarily care for the adult population.
7. An upper division Biochemistry course (UND BMB 301 or its equivalent). Please see the FAQs page (http://nursing.und.edu/programs/nurse-anesthesia/faq.cfm) for additional information on this requirement.
8. Successful interview by the Admissions Committee.
9. Meet current health and immunization requirements of the College of Nursing and Professional Disciplines.
10. Submit to and satisfactorily complete a background check prior to admission.
11. Applications must be received by track specific date (please see track website for additional information).
12. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Science degree with a major in Nursing at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the College of Nursing.

There is no residency requirement.
1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the for the M.S. thesis option or completion of for the M.S. non-thesis option.
5. Clinical site visits by nursing professors are required by various certifying and accrediting bodies to appropriately supervise the learning experience of students. A clinical site visit course fee is required to offset the expenses to travel, arrange, and supervise clinical experiences across the state and beyond. Prospective students will be made aware of the Clinical Site Visit Course Fee structure through posting of the fees structure on the College of Nursing and Professional Disciplines website and in the College’s Graduate Handbook.
6. Required Courses:

Nurse Anesthesia
Course List

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Total Credits 76

Students complete 29 credits of NURS 597 Advanced Clinical Practicum to comply with accreditation standards for supervised practice hours in anesthesia nursing. Total credits: 78-80.

Nurse Educator

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The purpose of master’s education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.
Program Goals
1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.
2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.
3. Participate as members and leaders of interprofessional health care teams.
4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Master of Science (M.S.)
Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science with a major in Nursing include:

1. At the time of application, a baccalaureate degree in nursing from an NLNAC or CCNE accredited nursing program. (Foreign schools will be evaluated on an individual basis.)
2. Minimum GPA of at least 3.00 for the last two years of baccalaureate nursing study.
3. An undergraduate or graduate course in statistics.
4. Current unencumbered U.S. R.N. licensure (submit copy with application.).
5. One year of experience as a registered nurse (preferred).
6. Successful Interview (on phone or in person)
7. Meet current health and immunization requirements of the College of Nursing and Professional Disciplines.
8. Submit to and satisfactorily complete a background check prior to admission.
9. Applications must be received by track specific date (please see track website for additional information).
10. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Science in Nursing degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the College of Nursing.

Thesis or the non-thesis options are available for all tracks.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. A thesis or non thesis option is available.
5. Required Courses:

Nurse Educator
Course List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>NURS 500</td>
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<td>NURS 502</td>
<td>Evidence for Practice</td>
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<td>NURS 509</td>
<td>Foundations for Nurse Education</td>
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<td>Adv Physiology/Pathophys II</td>
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<td>Ethical, Legal and Health Policy Issues</td>
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<td>NURS 566</td>
<td>Curriculum Development</td>
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<td>NURS 567</td>
<td>Teaching Methodologies</td>
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<td>NURS 568</td>
<td>Teaching Practicum</td>
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<td>NURS 569</td>
<td>Assessment and Evaluation</td>
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</table>

NURS 585 Advanced Health Assessment 3
Nurs 535 Advanced Pharmacology for Primary Care I 2
Nurs 539 Advanced Pharmacology for Primary Care II 2
NURS 997 Independent Study or NURS 998 Thesis 2-4
NURS 514 Essentials of Epidemiology 3

Total Credits 41-43

Family Nurse Practitioner
Mission Statement
The mission of the College of Nursing and Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

The purpose of master's education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.

Program Goals
1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.
2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.
3. Participate as members and leaders of interprofessional health care teams.
4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Master of Science (M.S.)
Admission Requirements
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science degree with a major in Nursing include:

1. At the time of application, a baccalaureate degree in nursing from an NLNAC or CCNE accredited nursing program. (Foreign schools will be evaluated on an individual basis.)
2. A minimum GPA of at least 3.00 for the last two years of baccalaureate nursing study.
3. An undergraduate or graduate course in statistics.
4. Current unencumbered U.S. R.N. licensure (Submit copy with application.).
5. One year experience as a registered nurse (preferred).
6. Successful Interview (on phone or in person)
7. Meet current health and immunization requirements of the College of Nursing and Professional Disciplines.
8. Submit to and satisfactorily complete a background check prior to admission.
9. Applications must be received by track specific date (please see track website for additional information).
10. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Science degree with a major in Nursing at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the College of Nursing.

NURS 997 Independent Study
or NURS 998 Thesis
NURS 514 Essentials of Epidemiology

Total Credits 41-43
Program Goals

1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.

2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.

3. Participate as members and leaders of interprofessional health care teams.

4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science degree with a major in Nursing include:

1. At the time of application, a baccalaureate degree in nursing from an NLNAC or CCNE accredited nursing program. (Foreign schools will be evaluated on an individual basis.)
2. Minimum GPA of at least 3.00 for the last two years of baccalaureate nursing study.
3. An undergraduate or graduate course in statistics.
5. One year of experience as a registered nurse preferred - experience with psychiatric mental nursing is desirable.
6. Interview (via web, phone, or in person) may be required.
7. Meet current health and immunization requirements of the College of Nursing.
8. Submit to and satisfactorily complete a background check prior to admission.
9. Applications must be received by track specific date (please see track website for additional information).
10. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science degree with a major in Nursing degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the College of Nursing.

Thesis or the non-thesis options are available for all tracks. There is no residency requirement.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the for the M.S. thesis option or completion of for the M.S. non-thesis option.
5. Clinical site visits by nursing professors are required by various certifying and accrediting bodies to appropriately supervise the learning experience of students. A clinical site visit course fee is required to offset the expenses to travel, arrange, and supervise clinical experiences across the state and beyond. Prospective students will be made aware of the Clinical Site Visit Course Fee structure through posting of the fees structure on the College of Nursing and Professional Disciplines website.

6. Required Courses:

Family Nurse Practitioner

(mostly on-line courses)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</td>
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<td>NURS 511</td>
<td>Adv Physiology/Pathophysiology II</td>
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<td>NURS 514</td>
<td>Essentials in Epidemiology</td>
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<td>NURS 523</td>
<td>Health Promotion</td>
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<td>Ethical, Legal and Health Policy Issues</td>
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<td>Family Nursing</td>
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<td>NURS 553</td>
<td>Role Development of the NP</td>
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<td>NURS 559</td>
<td>Maternal and Child Health in Primary Care</td>
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<td>NURS 585</td>
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Total Credits: 57-59

Psychiatric Mental Health Nursing Nurse Practitioner

Mission Statement

The mission of the College of Nursing and Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

The purpose of master’s education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.

Program Goals

1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.

2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.

3. Participate as members and leaders of interprofessional health care teams.

4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Degree Requirements

Students seeking the Master of Science degree with a major in Nursing degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the College of Nursing.

Thesis or the non-thesis options are available for all tracks. There is no residency requirement.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the for the M.S. thesis option or completion of for the M.S. non-thesis option.
5. Clinical site visits by nursing professors are required by various certifying and accrediting bodies to appropriately supervise the learning experience of students. A clinical site visit course fee is required to offset the expenses to travel, arrange, and supervise clinical experiences across the state and beyond. Prospective students will be made aware of the Clinical Site Visit Course Fee structure through posting of the fees structure on the College of Nursing and Professional Disciplines website.

6. Required Courses:

Psychiatric Mental Health Nursing Nurse Practitioner

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>NURS 502</td>
<td>Evidence for Practice</td>
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<tr>
<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</td>
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<td>NURS 511</td>
<td>Adv Physiology/Pathophysiology II</td>
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<tr>
<td>NURS 514</td>
<td>Essentials in Epidemiology</td>
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</tbody>
</table>
**Adult-Gerontology Primary Care Nurse Practitioner**

**Mission Statement**

The mission of the College of Nursing and Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

The purpose of master's education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.

**Program Goals**

1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.
2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.
3. Participate as members and leaders of interprofessional health care teams.
4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

**Master of Science (M.S.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science degree with a major in Nursing include:

1. At the time of application, a baccalaureate degree in nursing from an NLNAC or CCNE accredited program. (Foreign schools will be evaluated on an individual basis.)
2. A minimum GPA of at least 3.00 for the last two years of baccalaureate nursing study.
3. An undergraduate or graduate course in statistics.
5. One year of experience as a registered nurse (preferred).  
6. Meet current health and immunization requirements of the College of Nursing and Professional Disciplines.  
7. Submit to and satisfactorily complete a background check prior to admission.  
8. Applications must be received by track specific date (please see track website for additional information).

9. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

Students seeking the Master of Science degree with a major in Nursing at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies’ as well as particular requirements set forth by the College of Nursing.

Thesis or the non-thesis options are available for all tracks.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of all required NURS 597 Advanced Clinical Practicum courses for the M.S. degree.
5. Clinical observations by nursing professors are required by various certifying and accrediting bodies to appropriately supervise the learning experience of students.
6. Required Courses:

**Adult-Gerontology Primary Care Nurse Practitioner**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 500</td>
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<td>NURS 502</td>
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<td>NURS 510</td>
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<td>NURS 526</td>
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<td>Adult-Gerontology Illness Management I</td>
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Total Credits 57-59

**Advanced Public Health Nurse**

**Mission Statement**

The mission of the College of Nursing and Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

The purpose of master's education in nursing is to build upon undergraduate nursing education to prepare nurses with expanded theoretical and evidence-based knowledge for advanced roles in practice and education.

**Program Goals**

1. Integrate knowledge from science, humanities, theory, and research into evidence-based advanced nursing practice.
2. Utilize knowledge of organizational and systems leadership, quality improvement, health care technologies, and policy to ensure high quality patient care.
3. Participate as members and leaders of interprofessional health care teams.

**Advanced Public Health Nurse**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 500</td>
<td>Theories/Concepts Nursing</td>
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<td>NURS 502</td>
<td>Evidence for Practice</td>
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<td>Essentials in Epidemiology</td>
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<td>NURS 523</td>
<td>Health Promotion</td>
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<td>NURS 526</td>
<td>Ethical, Legal and Health Policy Issues</td>
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<td>NURS 531</td>
<td>Adult-Gerontology Illness Management I</td>
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<td>NURS 535</td>
<td>Advanced Pharmacology for Primary Care I</td>
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<td>NURS 553</td>
<td>Role Development of the NP</td>
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<td>NURS 597</td>
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Total Credits 52-54
4. Apply advanced nursing skills in order to plan, manage, and coordinate culturally appropriate health care for patient populations.

Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission requirements for the Master of Science in Nursing include:

1. A bachelor’s degree in nursing from an NLNAC or CCNE accredited program. (Foreign schools will be evaluated on an individual basis.)
2. A minimum GPA of 3.00 is based on all years of study at the undergraduate level and includes a GPA of 3.00 in undergraduate science coursework.
3. An undergraduate or graduate course in statistics.
4. Current R.N. licensure (Photocopy must be attached to application.).
5. One year of experience as a registered nurse (preferred).
6. Additional requirements for Nurse Anesthesia are an undergraduate course in biochemistry (or equivalent), an undergraduate college algebra course (equivalent or higher), one year of critical care nursing experience (two years are preferred), and a successful interview.
7. Meet current health and immunization requirements of the College of Nursing and Professional Disciplines.
8. Submit to and satisfactorily complete a background check prior to admission.
9. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
10. Applications must be received by September 1 of the calendar year.

Degree Requirements

Students seeking the Master of Science in Nursing degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the College of Nursing.

Thesis or the non-thesis options are available for all tracks. The thesis option requires completion of four credits of . The non-thesis option requires completion of two project-related credits of . There is no residency requirement.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Completion of the for the M.S. thesis option or completion of for the M.S. non-thesis option.
5. Clinical site visits by nursing professors are required by various certifying bodies to appropriately supervise the learning experience of students. A clinical site visit course fee is required to offset the expenses to travel, arrange, and supervise clinical experiences across the state and beyond. Prospective students will be made aware of the Clinical Site Visit Course Fee structure through posting of the fees structure on the College of Nursing and Professional Disciplines website and in the College’s Graduate Handbook.
6. Required Courses:

### Advanced Public Health Nurse

(on-line courses)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
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<td>NURS 502</td>
<td>Evidence for Practice</td>
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<td>NURS 514</td>
<td>Essentials in Epidemiology</td>
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<td>NURS 523</td>
<td>Health Promotion</td>
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<td>Ethical, Legal and Health Policy Issues</td>
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<td>NURS 546</td>
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NURS 549     | Advanced PHN Practicum II          | 3       |
NURS 550     | Global Public Health Issues        | 2       |
NURS 572     | Diverse Vulnerable Populations     | 3       |
NURS 592     | Advanced PHN Practicum III         | 4       |
NURS 997     | Independent Study                  | 2-4     |
or NURS 998  | Thesis                             |         |

Total Credits: 40-42

Students complete 11 credits of Advanced PHN Practicum, to comply with certification requirements.

Post-Master’s Certificate in Nursing

Certificate in Nurse Education

Admission Requirements

1. Master’s degree in nursing.
2. Licensure as a registered nurse.

Certificate Requirements

A total of 26 credits is required for the Nurse Education Certificate. The following courses are required:

<table>
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<tr>
<td>NURS 509</td>
<td>Foundations for Nurse Education</td>
<td>3</td>
</tr>
<tr>
<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</td>
<td>3</td>
</tr>
<tr>
<td>NURS 511</td>
<td>Adv Physiology/Pathophysiology II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 566</td>
<td>Curriculum Development</td>
<td>3</td>
</tr>
<tr>
<td>NURS 567</td>
<td>Teaching Methodologies</td>
<td>3</td>
</tr>
<tr>
<td>NURS 568</td>
<td>Teaching Practicum</td>
<td>2</td>
</tr>
<tr>
<td>NURS 569</td>
<td>Assessment and Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>NURS 585</td>
<td>Advanced Health Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 26

Doctor of Nursing Practice

Mission Statement

The mission of the College of Nursing and Professional Disciplines is to advance human well-being and improve quality of life for rural communities through innovative inter-professional education, research, and service.

The purpose of the Doctor of Nursing Practice program is to prepare nurse practitioners, clinical nurse specialists, nurse anesthetists and nurse midwives to be clinical practice leaders. The program is designed with a post-master’s entry point.

Program Goals

1. Integrate nursing science with knowledge of ethics, biophysical, psychosocial, analytical, and organizational sciences as a basis of practice and inquiry.
2. Develop and evaluate new practice approaches based on nursing science and associated theories.
3. Develop and evaluate care delivery for vulnerable populations.
4. Use advanced communication processes and skills to lead to quality improvement and patient safety.
5. Design and implement processes to evaluate outcomes of practice, practice patterns, and systems of care within a practice setting, health care organization or community against national benchmarks to determine variances in practice outcomes and population trends.
6. Design, direct, and evaluate quality improvement methodologies to promote safe, timely effective, efficient, equitable and patient-centered care.
7. Apply relevant findings to develop practice guidelines and improve practice and the practice environment.
8. Use information technology and research methods to improve patient care.
9. Demonstrate leadership in development and implementation of institutional, regional, and national health policy.
10. Employ clinical prevention and health promotion to improve population health with an emphasis on vulnerable populations.
11. Develop and sustain quality therapeutic partnerships with patients/clients to ensure optimal outcomes of advance nursing care.
12. Work effectively in collaborative professional partnerships.

**Doctor of Nursing Practice (DNP)**

**Admission Requirements**
The applicant must meet the Graduate School’s current minimum general admission requirements as published in the Graduate Catalog. Admission requirements for the Doctor of Nursing Practice include:

1. Completion of a Master’s degree or higher from a nursing program of study accredited by the Commission on Collegiate Nursing Education (CCNE) or the National League of Nursing Accrediting Commission (NLNAC).
2. Current licensure unencumbered and in good standing as a Registered Nurse with certification as a Nurse Practitioner, Clinical Nurse Specialist, Nurse Anesthetist or Nurse Midwife.
3. A minimum Grade Point Average of 3.0. Priority will be given to those applicants with a cumulative GPA of 3.5 or greater in graduate coursework.
4. Graduate level statistics course completed within the five years prior to admission.
5. A two page narrative stating the applicant’s professional goals for DNP education and describing how the DNP will contribute to those goals. The narrative should propose a clinical interest or practice problem topic for the applicant’s scholarly DNP project, with a scope that would yield a result such as a system-wide change at the organizational, regional, or national level; a new/revised state health policy; or the implementation of significant new services to a population or geographic region. This narrative will provide insight to the admissions committee on the applicant’s professional goals and expectations, determine whether the applicant’s topic corresponds to existing faculty expertise, and assess written communication skills.
6. Three letters of recommendation, one of which must be from a graduate-prepared nurse or faculty member. Letters should speak to applicant’s ability to be successful in the DNP, addressing items such as clinical skills, critical thinking, independent decision making, and collaborative skills with other health professionals, nursing leadership, etc.
7. Resume or curriculum vitae.
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
9. Interview may be required.
10. Background check from the CNPD approved vendor with satisfactory results prior to admission.

**Degree Requirements**

Students seeking the Doctor of Nursing Practice degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Nursing Department. The DNP nursing courses are offered online.

1. Completion of all course work with GPA of at least 3.0.
2. Satisfactory completion of at least 500 hours of advanced practice internship hours.
3. Satisfactory completion of an evidence based clinical project that informs practice.
4. Presentation of the evidence based practice project in a regional, national or international advance practice forum or conference.
5. Submission of final report of project for publication.
7. Required Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 503</td>
<td>The Business of Practice</td>
<td>2</td>
</tr>
<tr>
<td>NURS 512</td>
<td>DNP Core Concepts I</td>
<td>2</td>
</tr>
<tr>
<td>NURS 513</td>
<td>DNP Core Concepts II</td>
<td>2</td>
</tr>
<tr>
<td>NURS 519</td>
<td>Practice Leadership</td>
<td>2</td>
</tr>
<tr>
<td>NURS 522</td>
<td>Health Informatics</td>
<td>3</td>
</tr>
<tr>
<td>NURS 582</td>
<td>Health Policy</td>
<td>2</td>
</tr>
<tr>
<td>NURS 593</td>
<td>DNP Internship I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 594</td>
<td>DNP Internship II</td>
<td>4</td>
</tr>
<tr>
<td>NURS 595</td>
<td>DNP Internship III</td>
<td>4</td>
</tr>
<tr>
<td>NURS 596</td>
<td>DNP Capstone</td>
<td>2</td>
</tr>
<tr>
<td>NURS 598</td>
<td>Evidence Based Research I</td>
<td>3</td>
</tr>
<tr>
<td>NURS 599</td>
<td>Evidence-Based Research II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Intensives**

Students are required to attend an on-campus intensive experience one weekend per semester for purposes of professional mentoring, learning, networking, and enhancing skill development.

**Doctor of Philosophy (Ph.D.)**

**Admission Requirements**
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Completion of a bachelor’s or higher degree in nursing from a nationally accredited program or equivalent nursing preparation.
2. A cumulative Grade Point Average (GPA) of at least 3.0 for all undergraduate Nursing work and a GPA of at least 3.0 for the junior and senior years of undergraduate Nursing work (based on A=4.0).
3. A cumulative GPA of 3.5 or above in graduate Nursing coursework.
4. Graduate Record Examination or Miller’s Analogy Test scores within past five years.
5. Completion of a graduate level univariate statistics course.
6. Completion of a master’s level Nursing Theory course.
7. A one or two page paper stating the applicant’s research interests and professional goals.
8. Evidence of current, unencumbered U.S. licensure to practice as a registered nurse.
10. Resumé or CV.
11. Satisfy the Graduate School’s English Language Proficiency requirements as published in the graduate catalog.
12. An interview will be required for applicants meeting these basic admission requirements.
13. Submit to and satisfactorily complete a background check prior to admission.
14. Applications must be received by program specific date (please see program website for additional information).

Note: Applicants with earned master’s degrees from accredited schools may qualify for up to 30 hours of credit toward the doctoral degree. Credit will be awarded only for courses in which a grade of B or better has been achieved.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Nursing Department. The PhD nursing courses are offered online with synchronous and asynchronous delivery.

Ph.D. students will be required to develop and submit a nationally competitive grant to support their doctoral research.

Ph.D. students are required to submit an article for publication to a refereed journal and to present dissertation work to a regional or national audience.

Ph.D. students are required to participate in scholarly seminars on research, research ethics and writing for publication.

1. Students must complete a minimum of 90 semester credits of post-baccalaureate work, including an original dissertation.

2. Required Courses:

   Research (12-18 credit hours)
   NURS 573 Research Funding 3
   NURS 574 Quantitative Nursing Methods 3
   NURS 575 Qualitative Nursing Research 3
   NURS 580 Research Practicum 1-6

   Nursing Science (12-18 credit hours)
   Pre-requisite Masters level Nursing Theory course
   NURS 557 Foundations of Nursing Science 3
   NURS 565 Rural Populations and Rural Health 3
   NURS 577 Rural Healthcare Ethics 3
   NURS 586 Rural Health Programs and Research 3

   Scholarly Tools (9-12 credit hours)
   Pre-requisite Univariate Statistics
   NURS 514 Essentials in Epidemiology 3
   NURS 522 Health Informatics 3
   NURS 525 Applied Multivariate Statistics 3

   Functional Component (9-12 credit hours)
   NURS 509 Foundations for Nurse Education 3
   NURS 558 Research Design 3
   NURS 581 The Nurse Scientist 3

   Electives (12-30 credit hours)
   Courses will be selected by the student in consultation with the student’s faculty advisory committee to develop the particular research thrust of the student.

   Dissertation (18 credit hours), including
   NURS 579 Dissertation Seminar (three 1-credit hour courses) 1
   NURS 999 Dissertation (15 credit hours total required) 1-15

   Total Credits 90

3. Comprehensive Examination: Students must successfully complete a written and oral comprehensive examination prior to advancement to candidacy and approval of the dissertation proposal. The student’s Program of Study Form, Dissertation Committee Form, and all course work (excluding dissertation credits) must be completed before applying to the School of Graduate Studies to take the Comprehensive Examination.

4. Final Examination: A final examination will be scheduled and administered according to the rules of the graduate school.

5. All doctoral nursing courses taken at the University of North Dakota College of Nursing and Professional Disciplines must be completed with a grade of “B” or better. An individual course may not be taken more than twice.

6. Various nursing courses are offered by semester - not all courses are offered every semester.

Residency

There is no residency requirement; however, students are required to attend two “Intensive experiences” per year. The Intensive experience (3-5 days) will gather students and faculty on the UND campus or at a regional nursing research conference for purposes of scholarship, networking, and education.

Transfer Credits

A maximum of 30 semester credits may be transferred from a master’s program. All nursing courses that are transferred and become part of the student’s doctoral program of study must be achieved with a grade of “B” or better.

A maximum of 24 semester credits may be transferred for postmaster’s coursework.

Nutrition and Dietetics

http://nursing.und.edu/programs/nutrition-education-counseling/index.cfm
Alakaam, Gudmundson, Shin, Tande and Wang

Degree Granted: Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Master of Science in Nutrition Program in the Department of Nutrition and Dietetics (N&D) is to educate individuals who are likely to care for underserved populations for advanced professional roles in nutrition.

Through the specialization in nutrition and education and counseling online courses and practicum you will learn to:

• Assess nutrition education needs of diverse and at risk groups
• Develop and implement behavior theory approaches while considering unique cultural needs
• Evaluate the effectiveness of nutrition interventions for individuals and groups
• Apply educational theory, research and experiential knowledge in nutrition education and counseling activities.
• Demonstrate advanced professional practice skills in nutrition education and counseling

The overall goal of the graduate program is to enhance the nutrition profession through the development of advanced-level professionals who are able to:

• Integrate research, teaching, practice and service to identify nutrition problems and develop solutions, especially for rural, underserved areas.
• Communicate clearly, accurately and in a culturally appropriate manner.
• Demonstrate critical-thinking and intellectual awareness of problem-solving and assessment.
• Exhibit professionalism, ethical conduct, cultural competency and leadership skills.

Master of Science in Nutrition

Admission Requirements

1. Completion of a bachelor's or higher degree in nutrition, dietetics or closely related field from a regionally accredited college/university.
Students must have a grade of "C" or better in undergraduate courses in advanced nutrition, physiology and biochemistry. Recency of courses will be evaluated.

2. A cumulative Grade Point Average (GPA) of at least 3.0 for all undergraduate work and a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A=4.0).

3. A graduate or undergraduate course in statistics within the last five years.

4. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

5. Students who have received a bachelor's degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

6. Meet minimum requirements for admission set by the UND School of Graduate Studies.

Degree Requirements

Students seeking the Master of Science in Nutrition degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Department of Nutrition and Dietetics:

1. A minimum of 32 credits in the major, including 16 credits of core requirements
2. A maximum of one-fourth of the credit hours (eight semester credit hours) required for the degree may be transferred from another institution.
3. Successful completion of a comprehensive examination.
4. Required courses.

Curriculum

Core requirements for two specializations:

Graduate level statistics course 3

N&D 541 Biochemical and Physiological Basis of Nutrition: Macronutrients 3

N&D 542 Biochemical and Physiological Basis of Nutrition: Micronutrients 3

N&D 550 Nutrition Education and Program Planning 3

N&D 591 Seminar in Nutrition (repeatable, 1 credits needed) 1

N&D 594 Research Methods in Nutrition 3

Nutrition Education and Counseling Specialization course requirements:

N&D 560 Nutrition Counseling 3

NURS 582 Health Policy 2

N&D 596 Nutrition Education and Counseling Practicum 2

N&D 997 Independent Study 2-4

or N&D 998 Thesis

Electives 7

Nutrition Science Specialization course requirements (specialization not currently available):

NURS 510 Adv Physiology/Pathophysiology I 3

NURS 511 Adv Physiology/Pathophys II 3

N&D 554 Nutrigenomics 2

N&D 997 Independent Study 2-4

or N&D 998 Thesis

Electives 4-6

* hybrid courses

Electives - all specializations

Electives can come from any department that has relevant coursework. Courses must be approved by the student's academic advisor and be included on the student's Program of Study before the course is taken. Graduate level courses taken prior to acceptance as a graduate student at UND may be included in the student's Program of Study with approval of the student's advisory committee.

Courses

N&D 541. Biochemical and Physiological Basis of Nutrition: Macronutrients. 3 Credits.

Integration of the molecular, cellular, and physiologic aspects of macronutrient and energy metabolism in humans. Dietary energy, carbohydrates, fiber, lipids, proteins, nutritional interactions and metabolic consequences with emphasis on recent advances in macronutrient nutrition are explored. Prerequisites: Undergraduate or graduate biochemistry and physiology. F.

N&D 542. Biochemical and Physiological Basis of Nutrition: Micronutrients. 3 Credits.

Integration of the molecular, cellular, and physiologic aspects of vitamin and mineral metabolism in humans. Functions, biological availability, hormonal regulation, requirements, metabolic consequences of deficiencies or excesses, and interrelations with other nutrients with emphasis on current topics related to vitamins, minerals and phytochemicals. Prerequisites: Undergraduate or graduate biochemistry and physiology. S.

N&D 543. Advanced Topics in Lifecycle Nutrition. 2 Credits.

The course focuses on current and evolving research relating to the physiological changes and nutritional needs throughout the lifecycle with particular emphasis on health promotion and disease prevention.

N&D 544. Obesity and Eating Disorders. 2 Credits.

The course examines the socio-psychological, physiological and nutritional factors relating to disordered eating and body image. Obesity, anorexia nervosa, bulimia nervosa and disordered eating will be discussed, potential interventions with particular emphasis of the role of the nutritionist is investigated. Prerequisite: Admission to the program.

N&D 545. Nutrition in Disease Prevention and Wellness. 2 Credits.

An exploration of prevention and wellness models specifically designed to decrease the mortality and morbidity of chronic disease in the United States population. The course specifically focuses on the involvement of nutrition in this process. The unique needs and problems facing diverse and vulnerable populations are also addressed. Prerequisite: Admission to the program.

N&D 550. Nutrition Education and Program Planning. 3 Credits.

Theoretical, research and applied aspects of adult nutrition education. Curriculum design models, instructional tools, program planning and evaluation of education interventions will be discussed in the context of chronic disease prevention. Effective teaching strategies and procedural models for designing effective nutrition education programs targeting the general public will be presented. Prerequisite: Permission of Instructor. F, even years.

N&D 552. Professional Nutrition Precepting. 2 Credits.

This course provides both didactic content and opportunities for nutrition professionals to become effective preceptors of nutrition/dietetics students. Under the direction of faculty, dietitians and nutritionists will precept undergraduates in supervised practice settings.

N&D 553. Nutritional Health Advocacy and Policy. 3 Credits.

An analysis of U.S. public policy processes in relation to food and nutrition, with emphasis on the role of the nutrition professional in influencing the public policy process and advocating for food policies. 3 graduate credit hours. Prerequisite: Admission to the program. On demand.

N&D 554. Nutrigenomics. 2 Credits.

This course explores the interactions between genomics, genetics and nutrition. The course identifies possible roles of the nutrition professional in reducing client risk for developing nutrition-modifiable diseases. Prerequisites: Undergraduate courses in biochemistry and in physiology.

N&D 555. Small Grant Proposal Development. 1 Credit.

Development of small grant proposals to support nutrition-related program planning and research studies. Prerequisite or Corequisite: ND 551 or N&D 594.

N&D 560. Nutrition Counseling. 3 Credits.

Theoretical and applied aspects of health behavior counseling including behavior change theories and how to apply these to health care issues. Dietary behaviors will be discussed in the context of chronic disease prevention and management. Effective methods of counseling patients and clients that promote individual change will be presented for individual and group counseling across the lifespan of diverse populations. Prerequisites: N&D 550 and admission into the program. S, odd years.
The Department of Occupational Therapy shares the mission of the University of North Dakota and the School of Medicine and Health Sciences to serve the public through:

1. teaching and preparation of highly skilled entry-level occupational therapists;
2. scholarly and creative activity; and
3. service.

The mission is accomplished through integration of scholarly inquiry and application of occupation in teaching/learning and OT practice contexts. Promotion of health and wellness of the public through engagement in meaningful and valued occupations and commitment to best practices within the profession of OT are expected outcomes. Best practices in the profession will reflect the exemplars of self-reflection, client-centeredness, and occupation-centered practice driven by research evidence. The skills for lifelong learning and ethical and effective leadership will be promoted to enhance the quality of life for all people with whom we engage.

Program Goals

Goal 1: Students will be able to analyze and apply occupation-based theories, models of practice and frames of reference used to guide occupational therapy evaluation and intervention.

Goal 2: Students will be able to demonstrate an understanding of the use of screening and evaluation tools used to evaluate occupational performance and determine the need for occupational therapy intervention.

Goal 3: Students will be able to formulate and implement the therapeutic intervention plan to facilitate occupational performance.

Goal 4: Students will be able to apply principles of management and systems in the provision of occupational therapy services to individuals and organizations.

Goal 5: Students will organize, collect, analyze and evaluate clinical data, research evidence, professional literature, and measures of outcome in order to make informed, evidence-based decisions in occupational therapy practice, including improving practice outcomes.

Goal 6: Students will demonstrate knowledge and understanding of the AOTA Code of Ethics, Core Values and Attitudes of Occupational Therapy, and AOTA-Standards of Practice as guides for professional interactions in academic and practice settings.

Goal 7: Students will demonstrate professional behaviors and effective communication skills, both oral and written, across multiple contexts important to the practice of occupational therapy.

Master of Occupational Therapy (M.O.T.)

Admission Requirements

Pre-Occupational Therapy

A pre-OT student typically spends the first two years as a pre-major at the University of North Dakota to complete the program prerequisites. In the
beginning of the sophomore year when the student is completing the required courses as listed below, he/she must make written application for admission to the professional occupational therapy program. The CLEP in natural sciences will not meet the Biology and Chemistry requirements in Occupational Therapy. Students should carefully check all CLEP exams for potential acceptance at UND. A student must have at least a C in all prerequisite courses. The student must also obtain a minimum of a C in all professional level courses.

The following courses are required to be taken prior to professional program:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I &amp; General Biology I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>or BIOL 151</td>
<td>General Biology II &amp; General Biology II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 121</td>
<td>General Chemistry I &amp; General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
<td>4-3</td>
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<tr>
<td>or SOC 328</td>
<td>Sociological Statistics</td>
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<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
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<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
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<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
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<tr>
<td>ANAT 204L</td>
<td>Anatomy for Paramedical Personnel Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
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<tr>
<td>OT 200</td>
<td>Introduction to Occupational Therapy</td>
<td>2</td>
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<tr>
<td>Arts &amp; Humanities Electives</td>
<td>9</td>
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</tr>
<tr>
<td>Total Credits</td>
<td>57-56</td>
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</tr>
</tbody>
</table>

* As a prerequisite for PSYC 241 Introduction to Statistics, student needs to take MATH 103 College Algebra.
** When completing Arts and Humanities courses, it is required that the nine credits in fine arts as part of the requirements of the Essential Studies program at the University of North Dakota. You also want to ensure that you have fulfilled the global diversity requirement. More information on Essential Studies graduation requirements can be found at: http://www.und.edu/dept/registrar/EssentialStudies/esindex.html.

**Admission Requirements**

**Professional Program**

Admission to the professional program in occupational therapy is on a competitive basis with consideration given to pre-professional performance in the sciences, general graduation requirements, leadership potential, volunteer work and personal qualifications. Each application is thoroughly reviewed. This review includes the applicant’s academic record (must have minimum overall GPA of 2.75 based on a 4 point scale), pattern of withdrawals, incompletes, etc., elective coursework, volunteer and/or work experience, references, essay and a personal interview.

A prerequisite for admission to the UND Professional Program at the Year I level will be 60 hours of observation and 45 of those hours must be with a professional occupational therapy supervisor and should be distributed over the three required areas (Psychosocial, Physical Dysfunction, Pediatric).

**Year III Professional Program**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. Admission to the School of Graduate Studies requires:

1. Acceptance into the Professional Occupational Therapy program.
2. Successful completion of OT Professional Year I and II.
3. Completion of the School of Graduate Studies application forms.
4. Overall GPA of 2.75 or a 3.0 in both junior and senior years.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. Letter of endorsement from the Chair or Graduate Director of the Department that assures automatic advancement in status from the undergraduate program to the graduate program. The letter of endorsement will be written for students in good academic and professional standing in the program.

It is important to be aware that a felony conviction may affect a graduate’s ability to sit for the National Board for Certification in Occupational Therapy (NBCOT) certification examination or to attain state licensure as an Occupational Therapist. You will be asked to respond to the following questions when registering for the NBCOT exam:

- Have you ever been charged with or convicted of a felony?
- Have you ever had any professional license, registration or certification revoked, suspended or subject to probationary conditions by a regulatory authority or certification board?
- Have you ever been found by any court, administrative or disciplinary proceeding to have committed negligence, malpractice, recklessness, or willful or intentional misconduct, which resulted in harm to another?

Information regarding NBCOT’s process of screening applicants for Character Review may be found at: www.nbcot.org (http://www.nbcot.org). If you have any questions, the department will assist you in this process.

Many fieldwork facilities are requiring proof of immunizations, drug testing, fingerprints, and/or criminal background checks. It is the responsibility of the student to check the fieldwork information and to pay the cost for each process.

**Degree Requirements**

**Bachelor of General Studies Degree with Health Studies Option**

The BGS Health Studies degree is available to OT students who:

1. have completed their pre-OT work either at UND or at another institution.
2. have successfully completed the first two years of the OT professional sequence.

The BGS degree would normally then be awarded at the end of the Professional Year Two, prior to beginning the Graduate School career, if the student has completed all general UND graduation requirements, including:

1. 125 total credits,
2. 60 credits from 4-year schools, including at least 30 from UND,
3. 36 upper-level credits,
4. all essential studies requirements.

Students seeking the Master of Occupational Therapy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Occupational Therapy Department.

To maintain graduate student status, the professional level Year III student is required to maintain a GPA of at least 3.0 for all work completed in Year III. Students who were previously on academic or professional probation will be dismissed from the School of Graduate Studies if placed on one additional probation within the professional program.

**M.O.T Curriculum Sequence**

**PLAN OF STUDY GRID**

**Professional Year 1**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>Summer</td>
<td>OT 422</td>
<td>Anatomy Occupational Therapy</td>
<td>5</td>
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<tr>
<td></td>
<td>OT 426</td>
<td>Personal/Professional Development</td>
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Credits: 6
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT 423</td>
<td>Fundamentals of Neuroscience for Occupational Therapy</td>
<td>3</td>
</tr>
<tr>
<td>OT 425</td>
<td>Occupational Therapy with Infants and Pre-School Children</td>
<td>4</td>
</tr>
<tr>
<td>OT 427</td>
<td>Orientation to Occupational Therapy Theory</td>
<td>3</td>
</tr>
<tr>
<td>OT 428</td>
<td>Quantitative Rsrch Methods-O.T.</td>
<td>3</td>
</tr>
<tr>
<td>OT 431</td>
<td>Medical Science I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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<td><strong>OT 424</strong> Muscle Function in Health and Disease</td>
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<td><strong>OT 429</strong> Occupational Therapy with School Age Children and Young Adults</td>
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<td><strong>OT 430</strong> Psychosocial Aspects of Occupational Therapy for Children, Adolescents and Young Adults</td>
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<td><strong>OT 432</strong> Medical Science II</td>
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<td><strong>OT 433</strong> Group Leadership Skills in Occupational Therapy</td>
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<td><strong>OT 438</strong> Practicum: Children/Adolescents</td>
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<td><strong>OT 488</strong> Elective Fieldwork in Occupational Therapy</td>
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<td><strong>OT 497</strong> Cooperative Education</td>
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<td><strong>OT 593</strong> Teaching Experience in Occupational Therapy</td>
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<td><strong>OT 454</strong> Gerontic Occupational Therapy</td>
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<td><strong>OT 456</strong> Psychosocial Aspects of OT with the Maturing Adult</td>
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<td><strong>OT 458</strong> Qualitative Research Methods for Occupational Therapy</td>
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<td><strong>OT 460</strong> Introduction to Management and Leadership</td>
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<td><strong>OT 463</strong> Psychosocial Dysfunction Seminar and Practicum Integration</td>
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<td><strong>OT 469</strong> Interprofessional Health Care (Schedule A or B)</td>
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<td><strong>OT 452</strong> Assistive Technology I</td>
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<td><strong>OT 453</strong> Physical Aspects of OT with the Maturing Adult</td>
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<td><strong>OT 458</strong> Qualitative Research Methods for Occupational Therapy</td>
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<td><strong>OT 451</strong> Multicultural Competency in Occupational Therapy</td>
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<td><strong>OT 456</strong> Psychosocial Aspects of OT with the Maturing Adult</td>
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<td><strong>OT 461</strong> Management in the U.S. Healthcare System</td>
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<td><strong>OT 463</strong> Psychosocial Dysfunction Seminar and Practicum Integration</td>
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<td><strong>OT 469</strong> Interprofessional Health Care (Schedule A or B)</td>
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<td><strong>OT 480</strong> Introduction to Scholarly Writing in Occupational Therapy</td>
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<td><strong>Fall and Spring Semester Electives:</strong></td>
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<td><strong>OT 489</strong> Independent Projects</td>
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<td><strong>OT 490</strong> Occupational Therapy Seminar</td>
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<td><strong>OT 493</strong> Workshop</td>
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<td><strong>OT 494</strong> Directed Study in Occupational Therapy</td>
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<td><strong>OT 496</strong> Community Experience</td>
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<td><strong>OT 497</strong> Cooperative Education</td>
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<td><strong>OT 593</strong> Teaching Experience in Occupational Therapy</td>
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<td><strong>OT 585</strong> Fieldwork in Psychosocial Dysfunction</td>
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<td><strong>Schedule A: On-Campus Required Core Courses:</strong></td>
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<td><strong>OT 504</strong> Occupation and Vocation</td>
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<td><strong>OT 507</strong> Innovative Management and Leadership</td>
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<td><strong>OT 509</strong> Principles of Education in Occupational Therapy</td>
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<td><strong>OT 515</strong> Integration of Occupational Therapy Theory</td>
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<td><strong>OT 589</strong> Readings in Occupational Therapy</td>
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<td><strong>OT 508</strong> Therapeutic Procedures and Modalities in Occupational Therapy</td>
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<td><strong>OT 582</strong> Graduate Practicum</td>
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<td><strong>OT 593</strong> Teaching Experience in Occupational Therapy</td>
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<td><strong>OT 599</strong> Special Topics in Occupational Therapy</td>
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<td><strong>Schedule B: On-Campus Required Core Courses</strong></td>
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<td><strong>OT 593</strong> Teaching Experience in Occupational Therapy</td>
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OT 200. Introduction to Occupational Therapy. 2 Credits.

Prerequisite: Occupational Therapy majors only. F.

History, scope, objectives, and functions of Occupational Therapy. F, S.

OT 422. Anatomy Occupational Therapy. 5 Credits.

Detailed study of human anatomy, with an emphasis on skeletal muscle, its vasculature, and the peripheral nervous system. The laboratory portion of the course allows for a direct study of the human form through dissection of human cadavers. Prerequisite: Occupational Therapy majors only. F.

OT 423. Fundamentals of Neuroscience for Occupational Therapy. 3 Credits.

Survey of the major theories of behavior, cognition, and neurological disorders based on experimental findings in neuroanatomy, neuropsychology, and neurobiology. Laboratory included. Prerequisite: Occupational Therapy majors only. F.

OT 424. Muscle Function in Health and Disease. 4 Credits.

The study of musculature acting on the extremities and trunk. Theory and techniques of musculoskeletal evaluation with analysis of normal and pathological human motion. Laboratory included. Prerequisite: Occupational Therapy majors only. S.

OT 425. Occupational Therapy with Infants and Pre-School Children. 4 Credits.

Normal and abnormal human development, conception through the pre-school years. Emphasis on reflexes, sensory systems, neurodevelopmental systems, illness and trauma, assessment procedures, treatment techniques, families and intervention teams, and treatment outcomes. Laboratory included. Prerequisite: Occupational Therapy majors only. S.

OT 426. Personal/Professional Development. 1 Credit.

Promote self-awareness and interpersonal communication skills including basic listening skills, ability to provide meaningful feedback and appropriate group membership skills. Prerequisite: Occupational Therapy majors only. F.

OT 427. Orientation to Occupational Therapy Theory. 3 Credits.

Orientation to human occupation, occupational performance assessment, theoretical practice models, and core processes in occupational therapy. Prerequisite: Occupational Therapy majors only. S.

OT 428. Quantitative Research Methods O. 3 Credits.

Design and implementation of quantitative research, the evaluation of quantitative research studies, the interpretation of statistics as applied to occupational therapy, and the process of presentation and publication of quantitative research projects. Laboratory included. Prerequisite: Occupational Therapy majors only. F.

OT 429. Occupational Therapy with School Age Children and Young Adults. 4 Credits.

Normal and abnormal human development, disease and disability, school age through young adulthood. Emphasis on assessment, intervention planning and program outcomes for individuals with disabilities in a variety of practice settings including school, community, and medicine. Laboratory included. Prerequisite: Occupational Therapy majors only. S.

OT 430. Psychosocial Aspects of Occupational Therapy for Children, Adolescents and Young Adults. 4 Credits.

Psychosocial development and interruptions to development in children, adolescents, and young adults, with emphasis on OT evaluation, treatment planning and implementation, and treatment outcomes. Laboratory included. Prerequisite: Occupational Therapy majors only. S.

OT 431. Medical Science I. 2 Credits.

First in a two-semester sequence of courses, which covers human body systems and disease and disability groups discussed from all aspects of rehabilitation. Included are chronic illness, neurological and orthopedic conditions, general medicine and surgery, and sensory disabilities across the lifespan. Prerequisite: Occupational Therapy majors only. F.

OT 432. Medical Science II. 3 Credits.

Second in a two-semester sequence of courses, which covers human body systems and disease and disability groups discussed from all aspects of comprehensive rehabilitation. Included are chronic illness, neurological and orthopedic conditions, general medicine and surgery, and sensory disabilities across the lifespan. Integration included. Prerequisite: Occupational Therapy majors only. S.

OT 433. Group Leadership Skills in Occupational Therapy. 2 Credits.

Didactic and experiential learning in a small group setting. Provides students with opportunities to function as group facilitators in a variety of practice settings. Prerequisite: Occupational Therapy majors only. S.

OT 438. Practicum:Children/Adolescents. 1 Credit.

Observation and experience in a university-approved pediatric and/or adolescent facility; supervised by occupational therapists, educators, and allied health professionals. Prerequisite: Occupational Therapy majors only. S/U grading. S.

OT 451. Multicultural Competency in Occupational Therapy. 3 Credits.

Develop an understanding of and an appreciation for social-cultural and ethnic diversity and use that understanding to address issues, solve problems, and shape civic, personal, and professional behaviors. To recognize that diversity is intimately tied to the concepts of culture, race, language, identity and inter-group dynamics, as well as its applications to complex situations. These concepts are presented within the context of providing OT services. Prerequisite: Occupational Therapy majors only. S.

OT 452. Assistive Technology I. 3 Credits.

Introductory study of assistive technology devices and products, assessment, and application methods. Focuses on adaptations, modifications, and technology systems and services that assist individuals with disabilities in greater independence and accessibility across the lifespan. Laboratory included. Prerequisite: Occupational Therapy majors only. F, S.

OT 453. Physical Aspects of OT with the Maturing Adult. 5 Credits.

Study of the OT process as applied to physical dysfunction of the maturing adult. Emphasis is on OT evaluation, planning, implementation of treatment, and treatment outcomes. Laboratory included. Prerequisite: Occupational Therapy majors only. F, S.

OT 454. Gerontic Occupational Therapy. 2 Credits.

Occupational perspectives of the elderly, including age-related changes, assessment and intervention strategies and the role of occupational therapy in prevention and wellness programs. Laboratory included. Prerequisite: Occupational Therapy majors only. F, S.

OT 455. Psychosocial Aspects of OT with the Maturing Adult. 4 Credits.

Psychosocial development and interruptions to development in the maturing adult with emphasis on OT evaluation, treatment planning and implementation, and treatment outcomes. Laboratory included. Prerequisite: Occupational Therapy majors only. F, S.

OT 456. Qualitative Research Methods for Occupational Therapy. 3 Credits.

Design and implementation of qualitative research, evaluation of qualitative research studies, analysis and interpretation of qualitative data, and the process of publication and presentation of qualitative research projects. Laboratory included. Prerequisite: Occupational Therapy majors only. F.

OT 460. Introduction to Management and Leadership. 2 Credits.

Introduction to the management practices necessary to direct a quality health service and provide the knowledge and skills needed for entry-level leadership positions in OT practice. Focus is on clinical reasoning and critical analysis in administrative and management functions. Laboratory included. Prerequisite: Occupational Therapy majors only. F.

OT 461. Management in the U.S. Healthcare System. 2 Credits.

Provide an overview of health services system in the US and current trends and issues facing OT within this system. Content includes: federal and state roles, reimbursement of health care services, regulation, community services, health service providers, consultative, non-traditional areas of practice, service delivery models, legalities, and health policy advocacy. Prerequisite: Occupational Therapy majors only. S.
OT 462. Physical Dysfunction Seminar and Practicum Integration. 3 Credits.
The student begins to integrate and synthesize the theoretical knowledge of physical dysfunction with clinical practice. It requires the application of foundational knowledge, tools and the theory of practice inherent in the role of an OT. Occupational therapy experiences in facilities, supervised by registered occupational therapists, qualified health professionals and university faculty. Prerequisites: OT 422, OT 423, OT 424, OT 425, OT 426, OT 427, OT 428, OT 429, OT 430, OT 431, OT 432, OT 433 and OT 438. F.S.

OT 463. Psychosocial Dysfunction Seminar and Practicum Integration. 3 Credits.
Integration and synthesizing of theoretical knowledge with clinical experience toward the application of therapeutic use of self, self-evaluation, and communication skills in professional development. Occupational therapy experiences in mental health field facilities, supervised by registered occupational therapists, qualified health professionals and university faculty. Prerequisites: OT 422, OT 423, OT 424, OT 425, OT 426, OT 427, OT 428, OT 429, OT 430, OT 431, OT 432, OT 433 and OT 438. F.S.

OT 469. Interprofessional Health Care. 1 Credit.
A process-learning course intended to provide experience in building a team of health professionals from different professions. The focus is on learning to work effectively with an interprofessional health care team. Emphasis is placed on effective teamwork, the unique contributions of different professions, patient or family centered approach in health care delivery, and awareness of potential medical errors. S/U grading. F.S.

OT 480. Introduction to Scholarly Writing in Occupational Therapy. 1 Credit.
This course is designed to provide students with an understanding of the expectations and mechanics of scholarly writing. It is the first step for the development of a scholarly paper that is a requirement of the MOT program. The course outcome is the development of a proposal in an area of interest to the student(s) which has been approved and supervised by a faculty advisor to meet the first requirement of OT 995 Scholarly Project in OT or OT 997 Independent Study. Course content includes the mechanics of writing, development, content, and format of the scholarly paper; the use of appropriate resources; and a review of how to use the Publication Manual of the American Psychological Association and the OT department's graduate student manuals. S.

OT 488. Elective Fieldwork in Occupational Therapy. 3-18 Credits.
Application of occupational therapy in evaluation and treatment in optional areas of student special interest in selected fieldwork facilities. Variable credits, repeatable, with maximal total of 18 credits. Prerequisite: Occupational Therapy majors only. Repeatable to 18 credits. S/U grading. F,S,SS.

OT 489. Independent Projects. 1-3 Credits.
Individual study and/or research in a particular area of interest for the student(s) with approval of a supervising faculty member. Elective for OT majors. Prerequisite: Occupational Therapy majors only. Repeatable to 12 credits.

OT 490. Occupational Therapy Seminar. 1 Credit.
Foundational knowledge relevant to the preparation of an independent study proposal. Serves as the basis for OT 494: Directed Study in Occupational Therapy. Prerequisite: Occupational Therapy majors only. S/U grading. F.

OT 493. Workshop. 1-12 Credits.
A workshop course with topics dictated by faculty and student interests primarily for but not confined to continuing education. Prerequisite: Occupational Therapy majors only. Repeatable to 12 credits. S/U grading. F.

OT 494. Directed Study in Occupational Therapy. 1 Credit.
Development of a proposal in an area of interest to the student approved and supervised by faculty. Serves as the basis for OT 997: Independent Study or OT 995: Scholarly Project in OT. Prerequisite: Occupational Therapy majors only. S/U grading. S.

OT 496. Community Experience. 1-4 Credits.
Student initiates and participates in off-campus professional learning activities related to OT under joint faculty and on-site professional supervision. Prerequisite: Permission of Department. Repeatable to 12 credits. S/U grading. F,S,SS.

OT 497. Cooperative Education. 1-6 Credits.
Qualified students are employed by selected facilities to further understanding of occupational therapy and health-related service provision. Prerequisite: Occupational Therapy majors only. Repeatable to 12 credits. S/U grading. F,S,SS.

OT 504. Occupation and Vocation. 3 Credits.
Application of assessment and problem-solving skills necessary for remediation/rehabilitation of occupational performance deficits in the work realm. Laboratory included. Prerequisite: Occupational Therapy majors only. F.S.

OT 507. Innovative Management and Leadership. 3 Credits.
Develop and demonstrate an understanding of the skills necessary to plan, implement and evaluate programs and material for education, consultation and private practice. Prerequisite: Occupational Therapy majors only. F,S.

OT 508. Therapeutic Procedures and Modalities in Occupational Therapy. 2 Credits.
Occupational therapy theory and application of specific neuromuscular techniques and modalities to promote musculoskeletal function. Laboratory included. Prerequisite: Occupational Therapy majors only. F.S.

OT 509. Principles of Education in Occupational Therapy. 3 Credits.
Explores the methods and strategies used to develop, implement and evaluate education programs for students in academia and clinical settings, for patients/clients, businesses and professional staff. Information and discussion focus on the theory and research relevant to education in a variety of settings. Prerequisite: Occupational Therapy majors only. F.S.

OT 515. Integration of Occupational Therapy Theory. 3 Credits.
Analysis and applications of theoretical perspectives to occupational therapy process with individuals, groups, and service delivery systems. Prerequisite: Occupational Therapy majors only. F.S.

OT 582. Graduate Practicum. 1-3 Credits.
Supervised experience in a variety of OT practice settings. Students are afforded the opportunity to gain practical, on-the-job experience working in an area that matches the focus of their graduate study. Students will be supervised by on-site personnel. Prerequisite: Occupational Therapy majors only. Repeatable to 12 credits. S/U grading. F,S,SS.

OT 585. Fieldwork in Psychosocial Dysfunction. 9 Credits.
Application of occupational therapy in evaluation and treatment in psychosocial dysfunction fieldwork facilities. Three months full-time. Prerequisite: Occupational Therapy majors only. S/U grading. F,S,SS.

OT 587. Fieldwork in Physical Dysfunction. 9 Credits.
Application of occupational therapy in evaluation and treatment in physical dysfunction fieldwork facilities. Three months full-time. Prerequisite: Occupational Therapy majors only. S/U grading.

OT 589. Readings in Occupational Therapy. 1-2 Credits.
Selected readings in the student's area of interest with oral and/or written reports. Prerequisite: Occupational Therapy majors only. Repeatable to 6 credits. F,S,SS.

OT 593. Teaching Experience in Occupational Therapy. 1-3 Credits.
Supervised experience in higher education teaching in OT. Projects in course/curriculum development, writing course objectives, writing and delivering lectures and learning activities, and developing assessment tools for the classroom. Prerequisite: Occupational Therapy majors only. Repeatable to 12 credits. F,S,SS.

OT 599. Special Topics in Occupational Therapy. 1-2 Credits.
A series of lectures, discussions, and/or laboratory experiences developed around one or more specific topics in occupational therapy. Prerequisite: Occupational Therapy majors only. Repeatable to 6 credits. F,S,SS.

OT 995. Scholarly Project in Occupational Therapy. 2 Credits.
A collaborative investigation of a relevant professional topic and production of a scholarly report with approval of the major faculty. Prerequisite: Occupational Therapy majors only. F,S,SS.

OT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

OT 997. Independent Study. 2 Credits.
Independent investigation of a relevant professional topic and production of an independent scholarly report with approval of the major faculty advisor. Prerequisite: Occupational Therapy majors only. F,S,SS.
# Pharmacology, Physiology and Therapeutics

The Pharmacology, Physiology & Therapeutics program is no longer accepting applications.

Please go to the Biomedical Sciences page at:


The four graduate programs (Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, and Pharmacology, Physiology & Therapeutics) at the University of North Dakota School of Medicine and Health Sciences are now combined into an integrated, multi-disciplinary program in Biomedical Sciences. Students that entered the programs in fall 2014 will follow the newly developed curriculum and will become a part of the Biomedical Sciences graduate program. Students who enrolled in the four programs previous to fall 2014 will have the option of either completing degree requirements for the program in which they enrolled (found in previous UND Academic Catalogs) or transferring to and completing degree requirements for the Biomedical Sciences graduate program.

### Master of Science (M.S.)

#### Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university.
2. Successful completion of two semesters or equivalent course in general chemistry, and courses in general biology, general physics, and organic chemistry.
3. Undergraduate courses in analytical chemistry, calculus, genetics, physiology, biochemistry and statistics are desirable.
4. Overall undergraduate GPA of at least 3.0.
5. GRE scores on the General Test are required.
6. Graduate Students may be admitted to either the M.S. program or directly to the Ph.D. program.
7. Students who elect to begin the M.S. program and later decide to pursue the Ph.D. before finishing the M.S. program may do so by petitioning the Departmental Faculty. This action requires a GPA in accordance with the current academic catalog.
8. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
9. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

#### Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physiology, Pharmacology, and Therapeutics Department.

Students are advised to consult the current approved guidelines for additional requirements or changes.

The graduate requirements for a Master of Science in Pharmacology, Physiology and Therapeutics consist of required coursework and research leading to the preparation of a thesis. In addition to the general requirements listed in the Academic Catalog, the following must be completed by all candidates for the M.S. in Pharmacology, Physiology and Therapeutics.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.

### Coursework:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIMD 500</td>
<td>Cellular and Molecular Foundations of Biomedical Science</td>
<td>6</td>
</tr>
</tbody>
</table>

### Doctor of Philosophy (Ph.D.)

#### Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university.
2. Successful completion of two semesters or equivalent course in general chemistry, and or courses in general biology, general physics, and organic chemistry.
3. Undergraduate courses in analytical chemistry, calculus, genetics, physiology, biochemistry and statistics are desirable.
4. Overall undergraduate GPA of at least 3.00.
5. GRE score on the General Test are required.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
7. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PPT 503</td>
<td>Advanced Pharmacology or Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 525</td>
<td>Advanced Renal Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 526</td>
<td>Advanced Respiratory Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 527</td>
<td>Advanced Neurophysiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 528</td>
<td>Advanced Endocrinology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 529</td>
<td>Adv Cardiovascular Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 511</td>
<td>Biochemical and Molecular Mechanisms of Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 505</td>
<td>Research Techniques (Note: NOT an elective for Ph.D. students)</td>
<td>6</td>
</tr>
<tr>
<td>PPT 530</td>
<td>Advanced Neurochemistry</td>
<td>3</td>
</tr>
<tr>
<td>PPT 535</td>
<td>Mechanisms of Neurodegenerative Disorders</td>
<td>3</td>
</tr>
<tr>
<td>PPT 540</td>
<td>Molecular Neuropharmacology</td>
<td>3</td>
</tr>
</tbody>
</table>

* A student must obtain at least a “B” in PPT 500 Principles of Physiology and Pharmacology the first time they take the course in order to remain in good standing in the PPT graduate program. If less than a “B” is received, the student may petition the PPT Graduate Faculty in order to take the course a second time.

#### II. Teaching:

The teaching requirement will be defined by the student’s Faculty Advisory Committee and will include one semester of laboratory teaching, e.g., or the development, presentation, and assessment of lectures related to one educational unit as defined by the instructor of record in a Pharmacology, Physiology and Therapeutics undergraduate course.

#### III. Research and Thesis:

The M.S. in Pharmacology, Physiology and Therapeutics requires completion of a thesis based on the results of a research project completed by the graduate student under the guidance of a faculty advisor. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be published in a refereed scientific journal. The thesis prepared by the candidate must be presented and defended before the Faculty Advisory Committee and the Departmental Faculty.
8. Graduate students may be admitted to either the M.S. program or directly to the Ph.D. program.
9. Students who elect to begin the M.S. program and later decide to pursue the Ph.D. before finishing the M.S. may do so by petitioning the Department Faculty. This action requires a GPA in accordance with the current academic catalog.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physiology, Pharmacology, and Therapeutics Department.

The graduate requirements for a Doctor of Philosophy in Pharmacology, Physiology and Therapeutics consist of required coursework, satisfactorily passing the comprehensive exam, and research leading to the preparation of a dissertation. In addition to the general requirements listed in the Academic Catalog, the following must be completed by all candidates for the Ph.D. in Pharmacology, Physiology and Therapeutics.

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. At least one-half of the work must be in the major field.
4. Successful completion of a comprehensive examination.
5. Successful completion of dissertation.

I. Coursework:

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIMD 500</td>
<td>Cellular and Molecular Foundations of Biomedical Science</td>
<td>6</td>
</tr>
<tr>
<td>BIMD 510</td>
<td>Basic Biomedical Statistics</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 513</td>
<td>Seminars in Biomedical Science</td>
<td>1</td>
</tr>
<tr>
<td>BIMD 516</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>PPT 500</td>
<td>Principles of Physiology and Pharmacology</td>
<td>6</td>
</tr>
<tr>
<td>PPT 505</td>
<td>Research Techniques</td>
<td>3</td>
</tr>
<tr>
<td>PPT 521</td>
<td>Seminar in Pharmacology, Physiology and Therapeutics</td>
<td>1</td>
</tr>
</tbody>
</table>

Electives (See Elective course offerings. Three credits must be from PPT electives)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT 591</td>
<td>Research in PPT &amp; PPT 999</td>
<td>12</td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>89</td>
</tr>
</tbody>
</table>

II. Teaching:

The teaching requirement will be defined by the student’s Faculty Advisory Committee and will include one semester of laboratory teaching, e.g., PPT 301 Human Physiology, or the development, presentation, and assessment of lectures related to one educational unit as defined by the instructor of record in a Pharmacology, Physiology and Therapeutics undergraduate course.

III. Scholarly Tools

Students must complete at least one laboratory research techniques course, e.g., PPT 505 Research Techniques at the graduate level.

IV. Research and Dissertation

The Ph.D. in Pharmacology, Physiology and Therapeutics requires completion of a dissertation based on the results of a research project completed by the graduate student under the guidance of a faculty adviser. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be published in a refereed scientific journal. The dissertation prepared by the candidate must be presented and defended before the Faculty Advisory Committee and the Department Faculty.

BIMD Courses

BIMD 492. Peer Teaching and Tutoring in Biomedical Sciences. 1-4 Credits.
A course designed to provide individual students with the opportunity to peer teach and/or tutor for classes in the department of Biomedical Sciences. This experience will occur under the direction of a departmental faculty member. Experiences will have variation dependent on the class the student is assisting with. Open to all students with consent of the faculty member. Repeatable to 12 credits. S/U grading. F,S,SS.

BIMD 494. Directed Studies. 1-4 Credits.
A course designed to provide individual students with the opportunity for creative, scholarly and research activities in Biomedical Sciences under the direction of a departmental faculty member. Repeatable to 12 credits.

BIMD 501. Scientific Discovery I. 6 Credits.
A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will acquire skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. F.

BIMD 502. Scientific Discovery II. 6 Credits.
A problem based course in which students will address a set of biomedical research scenarios that have been designed so that students will advance their skills in critical thinking, finding, interpreting, and analyzing scientific literature, developing hypothesis-driven questions, proposing and designing experiments, and communicating scientific outcomes orally and in written format. This course is a continuation and advancement of BIMD 501. Prerequisite: BIMD 501. S.

BIMD 510. Basic Biomedical Statistics. 2 Credits.
A series of lectures, demonstrations and exercises to provide students with the basic rationales for the use of statistics in the assessment of biomedical data and a selected set of the most common and useful statistical tests. Prerequisite: BIMD 500 or permission of course director. S.

BIMD 513. Seminars in Biomedical Science. 1 Credit.
A series of presentations on original research conducted by UND faculty members as well as extramural leaders in academic and industrial research in the biomedical sciences. Students will participate through assigned reading and writing exercises related to the presentations.

* A student must obtain at least a “B” in PPT 500 Principles of Physiology and Pharmacology the first time they take the course in order to remain in good standing in the PPT graduate program. If less than a “B” is received, the student may petition the PPT Graduate Faculty in order to take the course a second time.
BIMD 514. Foundations of Bioinformatics. 3 Credits.
In this course, students will learn fundamental concepts and methods in bioinformatics, a field at the intersection of biology and computing. The course surveys a wide range of topics including bioinformatics web resources, computational sequence analysis, sequence homology searching and motif finding, transcriptome analysis, and network/pathway analysis. Students will also have opportunities to learn about available bioinformatics web-resources (e.g. UCSC Genome Browser, STRING/BioGRID interaction databases, and etc), next-generation sequencing analysis (focusing on RNA-Seq data) as well as relevant data-analysis tools (R and BioConductor, Ingenuity Pathway Analysis, DAVID, etc). The course will also familiarize students with the Linux environment and computational tools needed to manipulate and analyze large biological sequencing data sets. Students will need a familiarity with basic biomedical concepts and basic knowledge of computer usage. No programming skills are required. Students should bring their own well-enabled laptop to lectures to fully benefit from the hands-on components of each lecture. Prerequisite: Open to graduate and senior undergraduate students with permission of the instructor. F.

BIMD 516. Responsible Conduct of Research. 2 Credits.
A series of lectures and discussion sessions covering topics related to responsible conduct in research. Students will examine a variety of issues including introduction to ethical decision making, the experience of conflict, laboratory practices, data management, reporting of research, conflict of interest, and compliance. Examples and case studies will be drawn primarily from the biomedical sciences. F.

BIMD 517. Principles of Histology. 3 Credits.
Principles of Histology is a laboratory and discussion based course that builds on prior experience in cell biology and involves a strong self-study component through the use of virtual slides as well as lecture and laboratory orientation videos. By the end of the course the student will have demonstrated a significant knowledge base of tissue microanatomy sufficient for understanding and applying the principles to a wide range of research projects. The student will also have gained sufficient knowledge of histology to be capable of teaching this material to medical, professional, graduate, and undergraduate students. Prerequisite: PATH 500 or permission of instructor. S.

BIMD 518. Grant Writing. 2 Credits.
This is an advanced graduate grant writing and oral presentation course. The objectives of this course are to challenge students: (1) to critically evaluate their own research in an effort to clearly define the significance and innovation of their project, (2) to begin to develop novel ideas based on their research efforts that have the potential to significantly impact their field of study, and (3) to prepare students to present these ideas orally and in writing in a manner that is both logical and convincing. Prerequisites: BIMD 501 and BIMD 502, or consent of instructor. F.

BIMD 520. Principles of Neuroanatomy. 2 Credits.
In this course students will learn the fundamental principles of neuroscience, particularly gross and cellular anatomy, development and systems physiology of the nervous system. Behavioral, cognitive and clinical manifestations of abnormal neural functions will also be addressed. Prerequisite: BIMD 502 or permission of instructor. F.

BIMD 521. Neurophysiology. 2 Credits.
This course is designed to introduce students to the electrical properties of neuronal membranes. The course is organized to first provide a brief review of the basic properties of semi-permeable membranes. The electrical and biochemistry principles that apply to neuronal membranes are discussed. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 522. Principles of Neuropharmacology. 2 Credits.
This course is designed to introduce students to the latest developments in molecular neuropharmacology. The course directive is to provide an up-to-date foundation for clinical neuroscience by emphasizing a comprehensive molecular and cellular approach to the effects of drugs on the nervous system. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 523. Neurochemical Basis of the Nervous System. 2 Credits.
This course is designed to introduce students to fundamental concepts of brain metabolism and neurochemical signaling. It emphasizes recent advances in understanding brain biochemical processes and molecular mechanisms occurring in health and disease. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 524. Neurodegenerative Diseases and Pathophysiology. 2 Credits.
This course exposes students to diverse neurodegenerative diseases and nervous system pathophysiology. The emphasis is on mechanistic understanding of the most recent advances in the field. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 525. Readings in Neuroscience. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 526. Medical Experiences for Graduate Students. 1 Credit.
The goal of this course is to introduce the graduate student to a “disease-specific” clinical experience so that the student can acquire a better understanding of the importance of translational medicine, develop a firm appreciation of a patient’s and a physician’s understanding of disease and its treatment, and to introduce the student to the overall culture of clinical research. Prerequisites: Successful completion of comprehensive exam and permission of academic advisor and Instructor of Record; student should initiate discussion with the Instructor of Record at least one month prior to the start of enrollment. S/U grading. On demand.

BIMD 530. Components of the Immune System. 2 Credits.
Have you ever wondered why you don’t get sick every time you breathe air which can carry as many as 2000 different kinds of microbes on any given day? Or what keeps your defense system from attacking your own cells but can get rid of most invaders without you even noticing? This is the amazing task of your fascinating immune system! This course will provide an overview of cellular and molecular components of mammalian immune system and their function. The students will learn how these components are derived and how they interact and communicate with each other to coordinate a response to pathological insults in order to protect the human body. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 531. Components of Microbial Pathogenesis. 2 Credits.
The objective of the course is to provide students with a background in the mechanisms of microbial pathogenesis. Students will learn basic principles of host-parasite interactions. Paradigms of host-parasite interactions will be illustrated by studying, at the molecular and cellular levels, specific infectious diseases and the agents that cause them. Prerequisite: BIMD 502 or consent of instructor. F.

BIMD 532. Microbial Gene Regulation. 1 Credit.
This course will provide an understanding of genetic regulation in bacteria. Classic pathways will be examined as paradigms of regulatory circuits. These examples will be expanded to learn how bacteria exploit host cells as well as the use of bacterial regulatory circuits in modern molecular biology. S.

BIMD 533. Microbial Membranes and Transport. 1 Credit.
This course will explore bacterial membranes with particular emphasis on generation of energy and transport of molecules across the membranes. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 534. Microbial Cell Structure and Function. 1 Credit.
Microbial cells have unique structures that relate their functions. Students completing this course will have an understanding of how prokaryotic and eukaryotic organisms differ and how different structures can be used to obtain similar functions. They will understand how microbial structures influence interactions between microbes and between microbes and eukaryotic organisms. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 535. Bacterial Host: Pathogen Interactions. 1 Credit.
The objective of the course is to provide students with a background in the fundamental aspects that occur at the bacterial: host interface. Students will learn the interplay between bacterial virulence factors, strategies used to evade host defenses, and host responses to infection. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 536. Molecular Biology and Pathogenesis of Viruses. 1 Credit.
This course will cover the structure, replication, and pathogenesis of human RNA and DNA viruses, the host immune response to viral infection and the strategies employed by viruses to escape immune detection and elimination. Prerequisite: BIMD 502 or consent of instructor. S.
BIMD 537. Host-Pathogen Interactions Involving Eukaryotic Microbes (Parasites/Fungi). 1 Credit.
Eukaryotic microbe infections have a devastating impact on global health and economic development as they infect over one third of the world’s population and cause acute and chronic pathogens. Furthermore, macroscopic parasites (helminths/ worms) are master regulators of host inflammatory response and hence reduce the immune response to coinfections and negatively affect the success of vaccination programs against many other pathogens. In contrast, it has been proposed that the rise in autoimmune diseases in the developed world could be a direct result of the successful complete elimination of parasitic helminths in these communities. Thus, the purpose of this course is to provide a basic knowledge of the clinically important eukaryotic microbe pathogens and the immune response associated with their infections. A series of lectures will cover course components: a) basic introduction to protozoa, helminth, and fungi, and b) basic knowledge of the immune response and its involvement in parasitic/ fungal infections. An effort has been made to increase clinical relevance and problem-solving skills through a team-learning exercise involving quiz and paper presentations. S.

BIMD 538. Immunological Disorders. 1 Credit.
This course will include discussion of cellular and molecular immunopathologies leading to autoimmune diseases, and primary and secondary immunodeficiencies; and the role of the immune system in tumorigenesis and transplantation, as well as various methods of modification of the immune response. Prerequisite: BIMD 502 or consent of instructor. S.

BIMD 539. Readings in Microbiology and Immunology. 1-4 Credits.
A supervised readings course on topics of mutual interest to the student and a faculty member. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 4 credits. On demand.

BIMD 590. Research. 1-12 Credits.
The course allows research in pertinent problems in various aspects of biomedical sciences. Repeatable. F.S.S.S.

BIMD 591. Advanced Topics in Biomedical Sciences. 1-3 Credits.
A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the biomedical sciences. Repeatable as topics vary. Prerequisite: BIMD 502 or consent of instructor. Repeatable to 6 credits. On demand.

BIMD 998. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F.S.S.S.

BIMD 999. Dissertation. 1-12 Credits.
Completion of dissertation required for Ph.D. Repeatable to 12 credits. F.S.S.S.

PPT Courses

PPT 500. Principles of Physiology and Pharmacology. 6 Credits.
Graduate level survey course covering basic principles of human physiology and pharmacology. Material covered will include the physiology (how the body works) and the pharmacology (how drugs affect physiological functions) of major organ systems. Covered also will be basic pharmacological principles including pharmacodynamics, pharmacokinetics and therapeutics. Teaching modalities used are designed to actively engage students in critical thinking and knowledge application. Prerequisite: BIMD 500 or consent of instructor.

PPT 503. Advanced Pharmacology or Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 505. Research Techniques. 1-3 Credits.
Prerequisite: Consent of instructor.

PPT 511. Biochemical and Molecular Mechanisms of Pharmacology. 3 Credits.
Fundamental concepts of pharmacology with emphasis on biochemical and molecular mechanisms. Prerequisites: BIMD 500 and PPT 500, or consent of instructor.

PPT 512. Special Topics in Pharmacology, Physiology and Therapeutics. 2 Credits.
An in-depth coverage of a particular topic chosen by the instructor. Prerequisite: Consent of instructor.

PPT 521. Seminar in Pharmacology, Physiology and Therapeutics. 1 Credit.
S/U grading.

PPT 525. Advanced Renal Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 526. Advanced Respiratory Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 528. Advanced Endocrinology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 529. Advanced Cardiovascular Physiology. 3 Credits.
Prerequisite: PPT 500 or consent of instructor.

PPT 530. Advanced Neurochemistry. 3 Credits.
This course is designed to introduce graduate students to the discipline of neurochemistry. The course builds on concepts introduced in PPT 500, with an emphasis on brain biochemical processes occurring in health and disease. Prerequisite: PPT 500 or consent of instructor.

PPT 590. Readings in PPT. 1-4 Credits.
Prerequisite: Consent of instructor. Repeatable to 8 credits.

PPT 591. Research in PPT. 1-15 Credits.
Repeatable.

PPT 996. Continuing Enrollment. 1-12 Credits.
Prerequisite: Consent of instructor. Repeatable. S/U grading.

PPT 998. Thesis. 1-9 Credits.
Prerequisite: Consent of instructor. Repeatable to 9 credits.

PPT 999. Dissertation. 1-12 Credits.
Prerequisite: Consent of instructor. Repeatable.

Physical Education

(See Kinesiology and Public Health Education (p. 527))

Physical Therapy

http://www.med.und.edu/physical-therapy/

FACULTY: Danks, Decker, Elbert, Flom-Meland, Jeno, B. Johnson, K. Johnson, LaBrecque, Mabey, P. Mohr, T. Mohr, Relling (Chair and Graduate Director), Romanick, Schindler and Wessman

Degree Granted: Doctor of Physical Therapy (D.P.T.)

The Department of Physical Therapy offers the clinically-oriented, entry-level Doctor of Physical Therapy (DPT) degree. Students interested in the physical therapy program at UND should stay in contact with the PT department to keep informed of the pre-professional and professional curriculum. The website address is: http://www.med.und.edu/physical-therapy.

Physical therapists provide services to patients who have impairments, activity limitations, and participation restrictions related to environmental or personal factors. Physical therapists assist patients in restoring health; alleviating pain; examining, evaluating, and diagnosing changes in physical function and health status resulting from injury, disease, or other causes. Physical therapists are also involved with intervention, prevention, and the promotion of health, wellness, and fitness. They are employed by hospitals, outpatient clinics, rehabilitation centers, skilled nursing facilities, home care, school systems, industrial settings, athletic facilities, and in private practice.

The Physical Therapy program is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE).

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Doctor of Physical Therapy (D.P.T.)

Mission Statement and Program Goals

The mission of the Department of Physical Therapy is to prepare physical therapists with the clinical, professional and critical inquiry skills to provide quality physical therapy services. The professional services provided by a physical therapist demand a strong background in the liberal arts and clinical sciences as well as high moral and ethical standards. In addition to clinical
practice expectations, responsibilities in teaching, service and critical inquiry are an integral part of the educational experience.

**Goal 1:** The student will demonstrate the skills necessary for the entry level practice of physical therapy.

**Goal 2:** The student will demonstrate advocacy skills for health and wellness at the individual and societal level.

**Goal 3:** The student will provide service to the community and/or to the profession.

**Goal 4:** The student will develop critical inquiry skills related to clinical and basic science research.

**Goal 5:** The student will develop the skills required for life-long learning.

**Doctor of Physical Therapy (D.P.T.)**

**Admission Requirements**

**Pre-Physical Therapy**

Prior to admission, a minimum of 90 semester hours of credit from an approved college or university is required. Students should be broadly educated in the sciences and humanities. The Department of Physical Therapy recognizes that, since physical therapy deals with people, an understanding of literature, art, history, ethics, and philosophy is an adjunct to a physical therapist. Science and humanities are both viewed as necessary for the practice of physical therapy.

The following list of courses and credits indicates the core prerequisites all applicants must complete prior to admission to the physical therapy program. It is strongly recommended that students be computer literate prior to entering the professional program. Students may take additional electives from any field of study; however, the depth of the pre-physical therapy education should demonstrate that students have progressed from simple to complex studies in at least one content area. This requirement might typically be demonstrated by a discipline major, but in any case should demonstrate a basic comprehensiveness and integrity of study within a particular content area. This does not suggest that a separate undergraduate degree must be awarded; however, the breadth and depth in a discipline should be demonstrated. Course credits equivalent to a minor, i.e., approximately 20 credits at UND, in a particular discipline could accomplish this requirement. The prospective student should include eight (8) credits from upper level courses, i.e., 300 and/or 400 numbers.

- Two semesters of General Biology (8 cr.)
- Two semesters of General Chemistry (8 cr.)
- Two semesters of General Physics (8 cr.)
- One semester of Human Anatomy (3 cr.)
- One semester of Human Physiology (3 to 4 cr.)
- One semester of Introductory Psychology (3 cr.)
- One semester of Developmental Psychology (3 to 4 cr.)
- One semester of Abnormal Psychology (3 cr.)
- One semester of a Public Speaking course (3 cr.)
- One semester of an undergraduate statistics course (3 cr.)
- Essential Studies requirements

All of the prerequisite coursework must be completed before entering the professional program; however, the prospective student may be enrolled in pre-professional coursework at the time of application. All students must apply for the professional program through the PTCAS system. WICHE-eligible students should also apply through the WICHE certification process. Please refer to the UND-PT website at: www.med.und.edu/physical-therapy for application details.

**Admission Requirements**

Acceptance is on a competitive basis, with the major determinant being the basic science grade point average. The basic science GPA is defined as: biology (eight semester credits), chemistry (eight semester credits), physics (eight semester credits), anatomy (three semester credits), physiology (four semester credits), and psychology (seven semester credits). In addition to the science GPA, GRE score, and cumulative GPA, an interview and letters of reference will be considered in the admission process. Prospective students are expected to complete at least 60 hours of physical therapy observation prior to application.

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Completion of the application for admission to the professional program and UND School of Graduate Studies application form.
2. Submission of score from the Graduate Record Examination General Test.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. Applicants who have received their bachelors or masters degree in the United States or English-speaking Canada are not required to submit the TOEFL or IELTS.

**Degree Requirements**

1. Students must be formally accepted into the professional education component of the DPT and endorsed by the Chair of Physical Therapy. NOTE: Acceptance by the UND Office of Admissions or the School of Graduate Studies does not constitute acceptance into the professional program in Physical Therapy.
2. The professional education component of the DPT will require three academic years and two summer sessions following completion of the pre-physical therapy entrance requirements.
3. No student will be allowed to remain in the program or complete the full-time clinical experiences unless he/she attains a letter grade of at least “C” in the major courses.
4. To advance to candidacy, the student must successfully complete the first year comprehensive examination, and maintain a cumulative School of Graduate Studies GPA of # 3.00 AND/OR a summer session GPA of # 3.00. Students who fail to advance to candidacy during the first year will be dismissed from the professional program.
5. After advancement to candidacy, the student is expected to maintain a cumulative GPA of # 3.00. The School of Graduate Studies will monitor the cumulative GPA, which must be # 3.00. If the cumulative GPA is not # 3.00, the School of Graduate Studies policies for probation and dismissal will govern the student’s status.
6. Students in the professional program should be aware there are special requirements for clinical uniforms, professional liability insurance, medical insurance, immunizations, CPR certification, and completion of a criminal background check. These requirements must be met prior to any clinical contact with patients. The student will also be responsible for travel, housing, and food costs, in addition to the payment of tuition and fees, during the full-time clinical experience semesters. The majority of these experiences will be completed at geographical locations other than the City of Grand Forks.
7. Prospective students should be aware that a felony conviction may affect a graduate’s ability to obtain a professional license to practice physical therapy.
8. The faculty reserves the right to place on professional probation or to cancel the registration of any student in Physical Therapy whose performance in the classroom or the clinic is unsatisfactory.

**Pre-Physical Therapy**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts and Humanities</td>
<td>9</td>
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<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>4</td>
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<tr>
<td>&amp; 150L</td>
<td>and General Biology I Laboratory</td>
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<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
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<tr>
<td>&amp; 151L</td>
<td>and General Biology II Laboratory</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
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<td>CHEM 122</td>
<td>General Chemistry II</td>
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<td>&amp; 122L</td>
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<tr>
<td>Social Science</td>
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</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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</table>
BACHELOR OF GENERAL STUDIES DEGREE WITH HEALTH STUDIES OPTION

This degree will be available to Physical Therapy students who:

1. do not already have a baccalaureate degree,
2. have completed at least 30 of the 90 pre-Physical Therapy credits at UND before beginning Professional Year One,
3. have successfully completed fall, spring and summer semesters of Professional Year One.

The BGS degree would normally then be awarded at the end of the summer semester of Professional Year One if the student has completed all general UND graduation requirements:

1. 125 total credits,
2. 60 credits from 4-year schools, including at least 30 from UND,
3. 36 upper-level credits,
4. all essential studies requirements.

PROFESSIONAL PROGRAM - PHYSICAL THERAPY

Professional Year 1

Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PT 402</td>
<td>Professional Communication and Behavior</td>
<td>2</td>
</tr>
<tr>
<td>PT 420</td>
<td>Musculoskeletal System Examination</td>
<td>2</td>
</tr>
<tr>
<td>PT 422</td>
<td>Anatomy for Physical Therapy</td>
<td>5</td>
</tr>
<tr>
<td>PT 423</td>
<td>Neuroscience for Physical Therapy</td>
<td>4</td>
</tr>
<tr>
<td>PT 435</td>
<td>Introduction to Patient/Client Care and Interventions</td>
<td>4</td>
</tr>
<tr>
<td>PT 510</td>
<td>Integrated Clinical Experience (Each semester during year one, a small group of students will perform a learning event outside of the PT department.)</td>
<td>0-1</td>
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<tr>
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Spring

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<th>Course Title</th>
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<tbody>
<tr>
<td>PT 409</td>
<td>Clinical Pathology I</td>
<td>3</td>
</tr>
<tr>
<td>PT 412</td>
<td>Biomechanics and Kinesiology</td>
<td>4</td>
</tr>
<tr>
<td>PT 413</td>
<td>Exercise in Health and Disease</td>
<td>3</td>
</tr>
<tr>
<td>PT 415</td>
<td>Motor Control</td>
<td>3</td>
</tr>
<tr>
<td>PT 417</td>
<td>Clinical Exam and Evaluation I</td>
<td>4</td>
</tr>
<tr>
<td>PT 426</td>
<td>Manual Therapy I</td>
<td>2</td>
</tr>
<tr>
<td>PT 510</td>
<td>Integrated Clinical Experience (Each semester during year one, a small group of students will perform a learning event outside of the PT department.)</td>
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Summer

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>PT 410</td>
<td>Clinical Pathology II</td>
<td>3</td>
</tr>
<tr>
<td>PT 510</td>
<td>Integrated Clinical Experience (Each semester during year one, a small group of students will perform a learning event outside of the PT department.)</td>
<td>0-1</td>
</tr>
<tr>
<td>PT 512</td>
<td>Therapeutic Agents</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td></td>
<td>19-20</td>
</tr>
</tbody>
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Total Credits: Minimum of 125 credits required

PT 101. Orientation Physical Therapy. 1 Credit.
Overview of the educational requirements, practice issues, and opportunities in the profession of physical therapy. Course content includes multimedia presentations, lectures, and observation in clinical settings.

PT 402. Professional Communication and Behavior. 2 Credits.
Lecture and practice in interprofessional and interpersonal communication including professional behavior, ethics, patient education, and written documentation. Prerequisite: Registered in Professional Physical Therapy Curriculum.
PT 409. Clinical Pathology I. 3 Credits.
Selected pathological conditions affecting the musculoskeletal system. Associated orthopedic diagnoses, surgical interventions, the influences of co-morbidities and pharmaceutical interventions, and safety concerns are discussed with an application to physical therapy patient/client management. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 410. Clinical Pathology II. 3 Credits.
Selected pathological conditions of body systems, associated surgical interventions, the influence of co-morbidities, pharmaceutical interventions, and safety concerns are discussed with application to physical therapy patient/client management. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 411. Biomechanics and Kinesiology. 4 Credits.
Biomechanics and kinesiology of musculature acting on the extremities and trunk. Clinical applications and evaluation of joint integrity and mobility, gait, range of motion and muscle performance. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. S.

PT 412. Motor Control. 3 Credits.
Lecture and laboratory work in therapeutic exercise to establish and maintain muscular control and coordination, including muscle re-education, facilitation, and relaxation. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 413. Clinical Examination and Evaluation I. 4 Credits.
Emphasizes patient/client management elements of examination and evaluation. Emphasis is given to the musculoskeletal and neurological systems. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 420. Musculoskeletal System Examination. 2 Credits.
Principles of musculoskeletal examination and evaluation including identification and palpation of surface anatomy, range of motion (ROM), measurement of joint ROM, and evaluation of muscle performance. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.

PT 422. Anatomy for Physical Therapy. 5 Credits.
Detailed lectures and demonstrations on musculoskeletal anatomy and neuroanatomy. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 423. Neuroanatomy. 4 Credits.
Structure and function of the human nervous system including pathophysiology and clinical applications relevant to physical therapy practice. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.

PT 426. Clinical Examination and Evaluation II. 3 Credits.
Introduction to joint mobilization/manipulation techniques. Emphasis is on mobilization/manipulation as it relates to peripheral joints and soft tissues of the human body. Basic examination, evaluation, and intervention techniques for the spine are also presented. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 435. Introduction to Patient/Client Care and Interventions. 4 Credits.
Basic physical therapy patient care skills addressing multiple areas of physical therapy practice. A sample of topics address injury to the integument, select interventions for all patients, positioning of patients, vital signs, aseptic technique, and basic wheelchair techniques. Laboratory. Prerequisite: Registered in professional physical therapy curriculum.

PT 490. Special Topics: Physical Therapy. 1-4 Credits.
Introduction and investigation of advanced clinical procedures and topics. Topics discussed will be dictated by student and faculty interests. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 4 credits.

PT 491. Independent Study. 1-4 Credits.
Research and independent study in a specialized area of Physical Therapy. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 509. Clinical Pathology I. 3 Credits.
Short-term clinical experience to provide hands-on experience for students to apply knowledge learned during the first year of the professional program. Experiences will be set up in acute care, sub-acute care, long-term care, out-patient orthopedic, or a rural site. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 3 credits. F,S,SS.

PT 511. Applied Movement Science and Rehabilitation Procedures. 4 Credits.
Integration of clinical evaluation, functional goals, and treatment planning for individuals with neurological and multiple musculoskeletal dysfunction. The primary focus is on rehabilitation skills including assessment, exercise, handling techniques, functional activities, equipment prescription, patient education, and ADLs, as well as community mobility and governmental services. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 512. Therapeutic Agents. 3 Credits.
Theory and application of various hydrotherapy, phototherapy, and thermotherapy modalities in Physical Therapy, including heat, light, sound, and water. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 514. Case Management I. 2 Credits.
Integrates multiple aspects of case management, including examination, evaluation, diagnosis, prognosis, plan(s) of care, and intervention strategies. Evidence based clinical decision making and verbal and written communications relative to case management will be emphasized. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 516. Electrotherapy. 2 Credits.
Theory and application of therapeutic electrical currents, biofeedback, electromyography, and nerve conduction velocity in physical therapy. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 521. Critical Inquiry I. 1 Credit.
Introduction to the collection of clinical data leading to a case study report. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 522. Administration in Physical Therapy. 3 Credits.
Lectures/discussion and seminar formats used to explore concepts of administration procedures as applied to Physical Therapy and the health care delivery system. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 523. Lifespan I. 3 Credits.
Content related to human development; age-appropriate patient/client management; family-centered care; health promotion and safety; and legislative, policy, and systems are applied to pediatric patient/client management. Evidence-based practice for specific, common pediatric conditions is emphasized in the application of core content concepts. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 524. Psychological Aspects of Disability. 2 Credits.
Readings and discussion course. Study of psychological coping mechanisms, reactions, and motivational factors pertinent to people with disabilities. Review of adjustment problems unique to specific disabilities and/or disease processes, including terminal illness. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 525. Clinical Examination and Evaluation II. 3 Credits.
Emphasis is given to physical therapy examination, evaluation, and diagnoses as related to an advanced dynamic biomechanical evaluation. Also included will be the integration of NMS and support systems; clinical reasoning resulting in referral and/or modified physical therapy interventions; and the communication of findings and recommendations. Lecture Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. F,S.

PT 526. Case Management II. 2 Credits.
Theory and application of manual therapy skills for examination and intervention techniques, including thrust and nonthrust mobilizations/ manipulations of the spine, pelvis, and associated areas. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 527. Critical Inquiry II. 2 Credits.
Application, analysis, and evaluation of clinical decision-making components, strategies, and skills. Preparation and presentation of a clinical case study. Prerequisite: Registered in Professional Physical Therapy Curriculum.
PT 528. Clinical Education I. 9 Credits.
The first in a sequence of four full-time clinical experiences in selected physical therapy provider centers throughout the United States. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 529. Clinical Education II. 9 Credits.
The second in a sequence of four full-time clinical experiences in selected physical therapy provider centers throughout the United States. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 535. Lifespan II. 2 Credits.
Examine the factors and forces that affect life quality in later years. The physiological, psychological, and sociological aspects of aging will be considered, including those influences in the cultural context that enhance and impede continued growth of the person. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 537. Strategies Early Intervention. 2 Credits.
This course is designed to review current practices in early intervention. Course materials will focus on characteristics of disabling conditions that influence growth and development of motor skills, cognition, and educational development. Emphasis will be on collaborative service provision with an interdisciplinary approach. Topics also covered include: current issues, assessment of the child/family unit, and legislative guidelines for service provision. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 538. Advanced Topics in Pediatric Physical Therapy. 3 Credits.
This course is designed to present current and advanced topics relating to pediatric physical therapy clients and their families. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 539. Prevention and Wellness. 2 Credits.
The theory and practice of prevention of injury, maintenance and improvement of wellness, and promotion of health and healthy behaviors across the lifespan. Concepts are applied to the general, athletic, and industrial populations, with a view to interprofessional involvement in wellness optimization. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 540. Cardiopulmonary Physical Therapy. 2 Credits.
This course is designed to expand the theoretical understanding and clinical application of cardiopulmonary physical therapy evaluation, examination, diagnosis, prognosis, intervention and outcomes. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 541. Clinical Examination and Evaluation III. 3 Credits.
Emphasizes patient/client management elements of examination and evaluation. Emphasis is given to systems screening, physical therapy diagnoses, and clinical reasoning resulting in referral and/or modified physical therapy intervention. Emphasis is also given to the communication of findings. Laboratory. F.

PT 544. Pharmacology for Physical Therapists. 1 Credit.
Pharmacological principles and implications for the clinical treatment of patients referred to physical therapy. Fundamentals of drug classification, actions of drugs, physiological mechanisms, and drug therapeutic and adverse effects. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 545. Medical Imaging for Physical Therapists. 2 Credits.
An introduction to medical imaging and an overview of its role in the health care delivery system. Topics include principles of medical imaging, imaging equipment, diagnostic imaging, and application of imaging principles to inform physical therapy care. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 549. Advanced Applied Anatomy/Clinical Kinesiology. 2 Credits.
Study of applied anatomy and its importance to research and clinical application, particularly as related to Physical Therapy. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 550. Interprofessional Health Care. 1 Credit.
A process-learning course intended to provide experience in building a team of health professionals from different professions. The focus is on learning to work effectively with an interprofessional health care team. Emphasis is placed on effective teamwork, the unique contributions of different professions, patient or family centered approach in health care delivery, effective communication, and awareness of potential medical errors. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.S.

PT 552. Clinical Education III. 9 Credits.
The third in a sequence of four full-time clinical experiences in selected physical therapy provider centers throughout the United States. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 553. Clinical Education IV. 9 Credits.
The fourth in a sequence of four full-time clinical experiences in selected physical therapy provider centers throughout the United States. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 561. Seminar:Physical Therapy. 1-4 Credits.
This course serves to focus student attention toward graduate study in Physical Therapy. Explore and discuss areas of interest for students and faculty. May repeat to 4 credits maximum. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 4 credits.

PT 562. Readings:Physical Therapy. 1-4 Credits.
Review of current literature pertinent to Physical Therapy; critical examination of design, content, and validity of conclusions. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 4 credits.

PT 572. Teaching Experience in Physical Therapy. 1-4 Credits.

PT 583. Critical Inquiry III. 1 Credit.
Introduction to research instruments including surveys, electrical and mechanical instrumentation critical to research methods. Includes discussion of validation, calibration, and reliability of instruments used in physical therapy research. Students develop a proposal for their scholarly projects and complete IRB use of human subject forms. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 584. Evidence in Practice. 2 Credits.
Application of qualitative and quantitative research designs. Interpretation of statistical tests used in evidence-based medicine. Critical review of current articles related to diagnosis, prognosis, therapy, harm, cost, systematic reviews, meta-analysis, and clinical practice guidelines. Application of evidence to physical therapy practice. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 590. Directed Studies:Clinical Concepts in Physical Therapy. 1-12 Credits.
Individualized study of a particular area of interest for the student approved by his/her major advisor and supervised by preceptors with specialty and/or recognized expertise in the area of interest. Study may include library research, clinical research, discussion/seminars, projects, and directed clinical experience. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 12 credits.

PT 591. Research in Physical Therapy. 2 Credits.
Students develop the ability to effectively and accurately interpret and communicate results/clinical outcomes as a component of the written Scholarly Project. Frequent group and/or individual meetings with the advisor incorporate peer review discussion to facilitate student development of professional written and oral communication skills. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 592. Case Management II. 2 Credits.
Case management with emphasis on the teaching and learning process and techniques targeted to promote and optimize physical therapy services, including advocacy. Strategies appropriate for conflict resolution are introduced. Professional development as a practitioner of physical therapy is emphasized through introduction and preliminary development of a portfolio. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 995. Scholarly Project. 1 Credit.
Students provide a final written and oral report to the faculty on the results of their collaborative Scholarly Project. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

PT 997. Research III:Independent Study. 2 Credits.
Physician Assistant Studies

http://www.med.UND.edu/physician-assistant/

FACULTY: Johnson (Medical Director), Holmes, Kaufman, McHugo (Department Chair), Metzger, Sieg, and Solberg.

Degree Granted: Master of Physician Assistant Studies (M.P.A.S.)

The Department of Physician Assistant Studies offers a Master of Physician Assistant Studies (MPAS) degree. This 24-month graduate program is accredited by the Accreditation Review Commission on Education for Physician Assistants, Inc. (ARC-PA). A minimum of a baccalaureate degree earned in the U.S. is required. Graduates are eligible to take the national certification exam administered by the National Commission on Certification of Physician Assistants, Inc. (NCCPA). Additional information and application materials can be found at: http://www.med.UND.edu/physician-assistant

Details pertaining to admission requirements, degree requirements, and courses offered can be found in the Degree section.

Master of Physician Assistant Studies (M.P.A.S.)

Mission Statement and Program Goals

The primary mission of the University of North Dakota Department of Physician Assistant Studies is to prepare selected students to become competent physician assistants working collaboratively with physician supervision, emphasizing primary care in rural and/or underserved communities within North Dakota as well as regionally, nationally and globally.

With this mission, the goal is to improve access to health care, help alleviate shortages of primary care providers and deliver quality, affordable and comprehensive health care to the people of rural and/or underserved populations.

The Program’s approach to education is based on the philosophy that students are highly motivated and bring with them unique personal and professional experiences. While the faculty and preceptor serve as catalysts, learning is the responsibility of the student. The interdisciplinary teaching approach integrates clinical skill and knowledge utilizing multiple techniques to facilitate learning. The goal is preparation of the student as a primary care provider in a variety of settings, utilizing a problem-oriented approach to logical thinking and sound judgment. Furthermore, the Program faculty believes that physician assistants are accountable and responsible for the quality of their practice and for life-long learning to assure their ability to continually improve the care they deliver.

Also central to the Program’s mission is the Preceptor/PA Student Team development. A unique characteristic of the UND PA Program is the partnering of the student with a primary care preceptor throughout the entire clinical portion of the Program. This team approach forms the foundation and models the physician and physician assistant relationship inherent in a primary care PA’s clinical practice. By completing the majority of clinical experiences in the office of a practicing primary care provider, students are assured experiences with common primary care conditions in a clinical practice setting. It is under the guidance and supervision of the preceptor in an individualized teaching relationship that the student gains clinical competencies and accomplishes role integration. This is closely monitored and augmented by the Program faculty.

Program Goals

1. Provide a comprehensive academic and clinical educational experience for students and achieve first time PANCE scores at or above the national average and aggregate scores at 100%.
2. Provide the academic and student support to make it possible for every entering student to graduate.
3. Prepare graduates to evaluate clinical data and research and make evidence based decisions to provide safe quality care for all patients.
4. Prepare graduates to meet primary care workforce needs.
5. Prepare graduates to improve access to medical care in North Dakota.

Master of Physician Assistant Studies (M.P.A.S.)

Admission Requirements

Applicants who are seeking admission to School of Graduate Studies must meet all of the minimum general School of Graduate Studies admission requirements identified in the graduate catalog. In addition, the prospective student must fulfill the requirements for admission to the graduate program in the Department of Physician Assistant Studies. Admission to the Physician Assistant Program within the School of Medicine and Health Sciences at the University of North Dakota is a competitive selection process. Each applicant is reviewed individually and evaluated on their own merits. For complete requirements, please see our website for the most current information regarding prerequisites and application instructions at http://www.med.UND.edu/physician-assistant/.

Entry Point 1

Licensed/Certified Health Care Professional with minimum of 3 years experience
(Non-regional applicants are readily accepted although preference is given to applicants from ND and surrounding states.)

Entry Point 2

Science-based educational background and minimum of 500 (1000 preferred) hours of direct patient care
(Designated for applicants from ND and surrounding states. Applicants from outside the region will not be considered.)

Academic Requirements

All applicants must obtain a four-year bachelor’s degree or graduate degree from a regionally accredited college or university within the U.S. (regional accreditation by MSA, NASC, NCA, NEASC-CHE, SACS-CC, or WACS-Sr.) before the application deadline. Health-related or science-based degrees are preferred. A minimum GPA of 3.0 or higher (on a 4.0 scale) is required in undergraduate work, or more recent transcripts showing improvement.

Prerequisite courses must meet the following criteria: semester-based, grade of B or higher (3.0 or higher on a 4.0 scale) with the exception of those denoted with an asterisk (*), and completed within the United States at a regionally accredited institution. For those courses below not indicating a specific academic level, higher-level coursework is preferable.

Prerequisite Coursework

All prerequisite coursework must be completed before the application deadline. Please make sure courses meet the standards below.

• Human Anatomy—3 credits, 200 level or higher, and lab preferred.
• Human Physiology—3 credits, 200 level or higher within 10 years of the application deadline, and lab preferred. Note: If a combined course such as Human Anatomy and Physiology, 2 full semesters are required and must be within 10 years of application deadline.
• Comprehensive Pharmacology (must cover all body systems)—3 credits, 200 level or higher within 5 years of the application deadline.
• Microbiology—preferably medical based with a lab.
• Medical Terminology
• Statistics—preferably statistics for psychology, sociology, or biology.
• Psychology (Entry Point 2 Applicants Only)
• Organic Chemistry/Biochemistry* (Entry Point 2 Applicants Only)—Two semesters, 300 level or higher, and labs preferred. Combinations may include (OChem I + OChem II) or (OChem + BioChem). *Grade of C or higher is acceptable only for courses in OChem and BioChem.

Recommended Coursework

• Technical Writing
• Genetics
Health Care Requirements

Health care experience must be completed within the United States and be related to direct (hands-on) human patient care showing commitment to a career in medicine. Experience should involve assessment and treatment relating to Western (allopathic) medicine and medical professional judgment. Hours accrued in a student/learner role are not acceptable. This ensures foundational knowledge and skills needed for successful completion of this program.

**Entry Point 1:**

Current professional licensure, registration, or certification in a clinical healthcare field is required with evidence of continued medical education throughout professional employment.

A minimum of three years recent full-time clinical healthcare experience in one's field of professional certification/licensure. Health care experience must include direct patient contact and high levels of responsibility involving complex critical thinking and decision making skills.

Licensed/certified health care professional disciplines which qualify for Entry Point 1 include, but are not limited to:

- Registered nurse, respiratory therapist, physical therapist, radiologic technologist and paramedic.

Clinical healthcare experiences which lack high level direct patient care and decision making responsibilities do not qualify to apply for this entry point, although these disciplines are certainly valuable to the practice of medicine. Examples of disciplines ineligible for Entry Point 1 include:

- Administrative assistant, hospital/clinic receptionist, phlebotomist, hospital chaplain, personal trainer, medical assistant, social worker, CNA, EMT, LPN, dental hygienist and massage therapist.

**Entry Point 2:**

500 hours (1000 preferred) health care experience involving assessment and treatment related to direct (hands-on) human patient care. Ideally, this experience should be over a period of months or years showing commitment to a career in medicine.

Health care experiences in the following disciplines which would qualify for Entry Point 2 include, but are not limited to:

- Certified medical assistant, certified nursing assistant, physical therapist assistant, emergency medical technician, and phlebotomist.

Although all health care disciplines are certainly valuable to the practice of medicine, clinical healthcare experiences which lack high level direct patient care and decision making responsibilities do not prepare students for successful completion of the accelerated program or the professional board exam. Examples of disciplines ineligible for Entry Point 2 include:

- Administrative assistant, ACLS/CPR instructor, hospital chaplain, non-clinical research assistant, pharmaceutical/medical supply representative, receptionist or other clerical position, student intern, veterinarian, etc.

**Preceptor Requirements**

All clinical sites and preceptors must be reviewed, evaluated, and approved for educational suitability by the program.

**Entry Point 1:**

Entry Point 1 applicants will apply as a team with a licensed physician (MD or DO) or physician assistant who is willing to serve as the primary clinical preceptor to the student during the clinical portion of the program. Medical practice must be in primary care/family medicine in a clinical setting. Preference is given to clinical sites in rural (<25,000 population) and/or underserved populations.

Completion of the preceptor profile form is required.

**Entry Point 2:**

Entry Point 2 applicants will be placed within a designated site to complete clinical rotations. Sites will be located in North Dakota and the surrounding area. Flexibility is expected as clinical sites may require relocation and adaptability. Entry Point 2 applicants may suggest a site in their home community upon acceptance into the program, however, those sites are NOT guaranteed.

**Additional Requirements**

1. Completed applications to CASPA and the UND School of Graduate Studies along with all supporting materials as explained at http://www.med.und.edu/physician-assistant/how-to-apply.cfm.
2. If applying under Entry Point 1 admission criteria, an arrangement (established with a complete Preceptor Profile as explained above) with a licensed physician (MD or DO) or physician assistant who is willing to serve as the primary clinical preceptor to the student during the clinical portion of the program. Medical practice must be in primary care/family medicine in a clinical setting. Preference is given to clinical sites in rural (<25,000 population) and/or underserved populations.
3. Completion of a successful interview.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. The Physician Assistant Program of the University of North Dakota School of Medicine and Health Sciences (UNDSMHS) has a responsibility to society to graduate the best possible future Physician Assistants. All graduates of the Program must have knowledge, skills, and capacities to function in a wide variety of clinical situations and to render a wide spectrum of patient care. All applicants must be able to meet the program’s academic and technical standards as indicated on the program website. Please review our website’s Academic and Technical Standards (http://www.med.und.edu/physician-assistant/standards.cfm) for matriculation, promotion, and graduation.
6. Prior to matriculation, students will be required to complete a health screening and a criminal background check. The health screening process is conducted by Student Health Services. Cost of the criminal background check and health screening are the responsibility of the student. If a student declines to undergo criminal background check and health screening or if findings of a grievous nature are revealed, the offer of admission may be revoked.

**Admission Preference**

North Dakota residents as well as residents from the surrounding states of Montana, Minnesota, and South Dakota are given admissions preference, although well-qualified out of state applicants are also readily accepted. Applicants from rural and/or underserved communities are also awarded preference. For Entry Point 1 applicants, preference is given to clinical sites in rural (<25,000 population) and/or underserved populations. For Entry Point 2 applicants, preference is evaluated based on a combination of residence, employment, and volunteer experience in rural and/or underserved communities.

**Degree Requirements**

Students seeking the Master of Physician Assistant Studies degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physician Assistant Program.

1. Successful completion of all courses in core curriculum.
2. Completion of a written scholarly project approved by the academic advisor.
3. Written comprehensive final examination.

**Required Courses:**

- PA 507 Medical Human Anatomy & Radiology I 3
- PA 508 Medical Human Anatomy & Radiology II 3
- PA 510 Human Physiology & Pathophysiology I 4
- PA 511 Human Physiology & Pathophysiology II 4
PA 516. EKG Interpretation 1
PA 517. Pharmacology I 2
PA 518. Pharmacology II 2
PA 521. Diagnostic Studies I 2
PA 522. Diagnostic Studies II 2
PA 523. Diagnostic Studies III 2
PA 525. Scholarly Project Development 3
PA 540. Primary Care I - Didactic 4
PA 541. Primary Care I Clinical 6
PA 550. Primary Care II - Didactic 6
PA 551. Primary Care II - Clinical 9
PA 560. Primary Care III - Didactic 7
PA 561. Primary Care III - Clinical 8
PA 566. Professional Issues & Role Development I 2
PA 567. Professional Issues & Role Development II 1
PA 568. Professional Issues & Role Development III 1
PA 569. Professional Issues & Role Development IV 1
PA 580. Specialty Clerkship 6
PA 581. Emergency Department Clerkship 4
PA 582. General Surgery Clerkship 4
PA 995. Scholarly Project 3

Total Credits 90

Courses

PA 507. Medical Human Anatomy & Radiology I. 3 Credits.
This online course is a review of the basic principles of anatomy in preparation for the clinical phase of the PA program. The students will be introduced to components of radiologic diagnostic studies such as x-ray, CT scans and other forms of imaging. Prerequisite: Admission to Master of Physician Assistant Studies Program. SS.

PA 508. Medical Human Anatomy & Radiology II. 3 Credits.
Continuation of PA 507. This online course is a continued review of the basic principles of anatomy in preparation for the clinical phase of the PA program. The students will review radiologic diagnostic studies such as x-ray, CT scans and other forms of imaging. Prerequisite: Admission to Master of Physician Assistant Studies Program. F.

PA 510. Human Physiology & Pathophysiology I. 4 Credits.
This system-based online course focuses on the physiologic and pathophysiologic functions of the human body from the cellular level, to organ systems, with emphasis on genetics. This course lays the foundation for understanding the underlying principles of human disease processes across the lifespan. Prerequisite: Admission to Master of Physician Assistant Studies Program. SS.

PA 511. Human Physiology & Pathophysiology II. 4 Credits.
Continuation of PA 510. This system-based online course focuses on the physiologic and pathophysiologic functions of the human body from the cellular level, to organ systems. This course lays the foundation for understanding the underlying principles of human disease processes across the lifespan. Prerequisites: Admission to Master of Physician Assistant Studies Program and PA 510. F.

PA 516. EKG Interpretation. 1 Credit.
This online course focuses on the principles and practical application of electrocardiography for the PA. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 517. Pharmacology I. 2 Credits.
This online system-based course focuses on the pharmacokinetic, pharmacodynamic, and pharmacogenetic concepts of the major drug classes across the lifespan. Federal regulations governing drug development, drug schedules, drug safety and legislation are included. In addition, drug interactions and contraindications and calculation of mathematical equivalents utilized in prescribing medications are reviewed. Prerequisite: Admission to Master of Physician Assistant Studies Program. SS.

PA 518. Pharmacology II. 2 Credits.
Continuation of PA 517. This online system-based course focuses on the pharmacokinetic, pharmacodynamic, and pharmacogenetic concepts of the major drug classes across the lifespan. In addition, drug interactions and contraindications and complementary and over the counter medications are discussed. Prerequisites: Admission to Master of Physician Assistant Studies Program and PA 517. F.

PA 521. Diagnostic Studies I. 2 Credits.
This online course focuses on laboratory, radiologic, and other diagnostic studies and acceptable values across the lifespan. Components encompass areas of radiology, hematology, chemistry, urinalysis, immunology, and microbiology. Emphasis will include routine and preventative studies for systems consistent with concurrent primary care course content. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 522. Diagnostic Studies II. 2 Credits.
Continuation of PA 521. This online course focuses on laboratory, radiologic, and other diagnostic studies in relation to disease processes across the lifespan using a system-based approach. Components encompass areas of radiology, hematology, chemistry, urinalysis, and microbiology. Emphasis will include systems such as neurology, reproduction, and renal consistent with concurrent primary care course content. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 521. SS.

PA 523. Diagnostic Studies III. 2 Credits.
Continuation of PA 522. This online course focuses on laboratory, radiologic and other diagnostic studies in relation to disease processes across the lifespan using a system-based approach. Components encompass areas of radiology, hematology, chemistry, urinalysis, and microbiology. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 522. F.

PA 525. Scholarly Project Development. 3 Credits.
This online course provides a brief review of statistical principles as applied in medical literature with specific focus on research methods. Implementing principles of evidence-based medicine; students will learn to critically appraise the value and significance of medical research to determine application in clinical practice. Aspects of population health will also be discussed as students select a topic and complete a project proposal for the scholarly project. Prerequisite: Enrollment in the Physician Assistant Program. F.

PA 540. Primary Care I - Didactic. 4 Credits.
This didactic course is held on the UND campus. Focus is on instruction in patient assessment including communication strategies for interviewing and eliciting a medical history, techniques for performing a basic physical examination, and accurate documentation of patient data. Normal and abnormal findings involving patients across the lifespan are also presented. Instruction in preventive health, behavioral science psychological development is also emphasized. Clinical skill labs are utilized to instruct physical examination skills. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 541. Primary Care I Clinical. 5 Credits.
This supervised clinical practical experience in a primary care setting allows students to apply communication strategies for interviewing and eliciting a medical history, techniques for performing a basic physical examination, and accurate documentation of patient data. Normal and abnormal findings involving patients across the lifespan are also evaluated with a preceptor in the clinical setting. Prerequisites: Admission to Master of Physician Assistant Studies Program. S.

PA 550. Primary Care II - Didactic. 6 Credits.
This didactic course is held on the UND campus. Focus is on the problem solving process for the diagnosis and management of acute and chronic medical conditions across the life span. Emphasis is placed on analyzing symptoms of disease and formulating differential diagnoses using a system-based approach. Systems such as cardiology, respiratory, endocrinology and musculoskeletal are included. Pharmacology and pharmacotherapeutics used to treat acute and chronic conditions in system-based areas are also emphasized. Clinical skill labs include skin suturing, casting and splinting and sterile technique. Prerequisites: Admission to Master of Physician Assistant Studies Program. S.
PA 551. Primary Care II - Clinical. 9 Credits.
This supervised clinical practice experience in a primary care setting allows students to focus on analyzing symptoms of disease, formulating differential diagnoses and treatment plans for patients across the life span. This clinical phase also includes a required supervised practicum in an urgent care setting. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 550. SS.

PA 560. Primary Care III - Didactic. 7 Credits.
This didactic course is held on the UND campus. Focus is on the problem solving process for the diagnosis and management of acute and chronic medical conditions across the life span. Emphasis is placed on analyzing symptoms of disease and formulating differential diagnoses using a system-based approach. Systems such as neurology, reproduction, renal and behavioral science are included. Pharmacology and pharmacotherapeutics used to treat acute and chronic conditions in system-based areas are also emphasized. Further emphasis is placed on managing patients with multiple co-morbidities in emergency, clinical, and surgical settings. Simulation and skill labs are utilized to further enhance critical thinking and medical decision making for treatment of patients across the life span. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 551. F.

PA 561. Primary Care III - Clinical. 8 Credits.
This supervised clinical practice experience in a primary care setting allows students to continue focusing and developing differential diagnoses and treatment plans for patients with complex medical disease across the life span. This clinical phase also includes a required supervised hospitalist practicum in an inpatient hospital setting. Prerequisite: Admission to Master of Physician Assistant Studies Program. Prerequisite or Corequisite: PA 560. F.

PA 566. Professional Issues & Role Development I. 2 Credits.
This online course discusses role definition and historical development for the physician assistant within the health care industry. The importance of professionalism as an expression of positive values and ideals demonstrating a high level of responsibility, ethical practice and sensitivity to a diverse patient population is also discussed. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 567. Professional Issues & Role Development II. 1 Credit.
Continuation of PA 566. This online course discusses further levels of professionalism with respect to adherence to legal and regulatory requirements, health care delivery systems and health policy, including rural and underserved populations. Cultural diversity and inclusion principles are also discussed. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 566. SS.

PA 568. Professional Issues & Role Development III. 1 Credit.
Continuation of PA 567. This online course discusses additional aspects of professionalism including accountability to patients, society and the profession, commitment to excellence and ongoing professional development. The importance of intellectual honesty and appropriate conduct will also be discussed. This course will also assist in preparing the student for clinical employment by stressing the importance of the interview, contract negotiations, privileges, certification, licensure and maintenance. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 557. F.

PA 569. Professional Issues & Role Development IV. 1 Credit.
Continuation of PA 568. This online course introduces the PA student to quality of care and reimbursement methods. Students will further understand the importance of patient safety and risk management as well as develop a response to medical ethics. Comprehensive role development will also prepare the student for entry level practice. Prerequisites: Admission to Master of Physician Assistant Studies Program and successful completion of PA 568. S.

PA 580. Specialty Clerkship. 5-6 Credits.
This supervised clinical practical experience is designed to expose the student to different disciplines of medicine to fulfill program requirements as determined by UND faculty advisor, community preceptor and PA student and as necessary for adequate entry level PA practice. One credit of PA 588 may be substituted for one of the required 6 credits. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 581. Emergency Department Clerkship. 4 Credits.
This required supervised clinical practical experience focuses on analyzing symptoms and formulating differential diagnoses of emergent and traumatic condition across the life span. This clerkship is intended to provide the student with hands-on experience in the care of patients with urgent and emergent conditions. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 582. General Surgery Clerkship. 4 Credits.
This required supervised clinical practical experience focuses on analyzing symptoms and formulating differential diagnoses of patients requiring surgical interventions. This clerkship is intended to provide the student with hands-on experience in the care of patients with surgical conditions. Emphasis is placed on the role of the PA in a surgical setting to enhance skills in sterile techniques, surgical assisting, suturing, documentation and pre-post-operative patient care. Prerequisite: Admission to Master of Physician Assistant Studies Program. S.

PA 588. International Clerkship. 1 Credit.
Course content elective - This course offers students clinical time in another country to become acquainted with problems in: health care delivery, mother and childcare, main nutrition, basic sanitation and preventative health care measures. One credit of PA 588 may be substituted for one of the credits required in PA 580. Prerequisites: Admission to Master of Physician Assistant Studies Program and approval from the Director of the Physician Assistant Program. On demand.

PA 589. Readings in Physician Assistant Studies. 1-2 Credits.
Course content elective - Selected review and reading of current professional literature in areas pertaining to the practice of a Physician Assistant. In collaboration with the faculty member, reading selection and method of evaluation are determined. Prerequisites: Admission to Master of Physician Assistant Studies Program and approval from the Director of the Physician Assistant Program. Repeatable to 6 credits. On demand.

PA 590. Continuing Enrollment in Physician Assistant Studies. 1-6 Credits.
Course content elective - This course provides additional time, if needed to complete required components of the Masters in Physician Assistant Studies. Repeatable to 12 credits maximum. Prerequisites: Admission to Master of Physician Assistant Studies Program and approval from the Director of the Physician Assistant Program. Repeatable to 12 credits. S/U grading. On demand.

PA 995. Scholarly Project. 3 Credits.
This online course allows the student to complete the scholarly project. Continued review and critique of the literature related to the topic area are required to formulate and write the final product. Students will also work with their advisor to objectively evaluate the scholarly project outcome. Prerequisite: Enrollment in the Physician Assistant Studies Program and completion of PA 525. S.

PA 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

Physics and Astrophysics
http://www.physics.und.edu

FACULTY: Barkhouse, Dewar, Kim (Chair), Lee, Marasinghe (Graduate Director), Oncel, Schwalm, Tung and Young

Degrees Granted: Master of Science (M.S.), Doctor of Philosophy (Ph.D.) and Five-Year B.S.-M.S.

The Department of Physics and Astrophysics offers graduate programs leading to the Master of Science and Doctor of Philosophy degrees. Current research in the department emphasizes solid-state physics, materials science,
astrophysics, and health physics. Departmental facilities permit both theoretical and experimental research investigations.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

**Master of Science (M.S.)**

**Mission Statement and Program Goals**

The primary functions of the Physics and Astrophysics Department are teaching, research and service. In accordance with the mission of the University, the department provides courses for physics majors and minors, and service courses to students in other programs in the College of Arts & Sciences and other units of the University.

**Goal 1:** Students will acquire competency in graduate level physics including mechanics, electromagnetism, quantum mechanics, and theoretical methods.

**Goal 2:** Students will acquire in-depth exposure to research.

**Goal 3:** Students will acquire skills in oral presentations and acquire experience in writing research papers.

**Goal 4:** Students will develop analytical skills needed as a professional physicist.

**Doctor of Philosophy (Ph.D.)**

**Student Learning Goals**

**Goal 1:** Students will acquire competency in graduate level physics including mechanics, electromagnetism, quantum mechanics, statistical physics, and theoretical methods.

**Goal 2:** Students will acquire skills to carry out programs of independent research at a research laboratory or as a university faculty member.

**Goal 3:** Students will acquire skills in oral presentations and acquire experience in writing research papers.

**Goal 4:** Students will develop analytical skills needed as a professional physicist.

**Five-year B.S.-M.S. Degree Program**

**Mission Statement and Program Goals**

**Goal 1:** To give high-achieving physics students an opportunity to earn a M.S. degree a year earlier than at most other institutions.

**Goal 2:** To attract more high-achieving students to our undergraduate program.

**Master of Science (M.S.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work (2.5 for M. Engr.) or a GPA of at least 3.0 for the junior and senior year of undergraduate work (based on a 4.0 scale).
3. Completed a minimum of 21 semester credits of undergraduate physics, plus mathematics through differential equations or the equivalent.
4. Coursework should include intermediate courses in mechanics, electricity and magnetism, optics, thermal physics, and modern quantum physics. Adequate preparation in general chemistry is also necessary.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. An applicant without satisfactory undergraduate training may be admitted to the program, but will be required to remove deficiencies by completing the necessary undergraduate courses without receiving graduate credit for them.
7. Ph.D. applicants are encouraged to submit the Graduate Record Examination scores for the general test and advanced physics test.

**Degree Requirements**

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physics and Astrophysics Department.

The program is designed to provide the student with basic physics courses at the graduate level and an introduction to research.

1. Minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
4. Complete the following courses:
   - PHYS 509 Methods of Theoretical Physics 3
   - PHYS 539 Quantum Mechanics 3
   - PHYS 541 Theory Electricity Magnetism 3
   - PHYS 545 Analytical Mechanics 3
5. Complete six additional hours from the following:
   - PHYS 510 Methods of Theoretical Physics 3
   - PHYS 540 Quantum Mechanics 3
   - PHYS 542 Theory of Electricity and Magnetism 3
6. Complete research project and PHYS 998 Thesis (4-9 credits).

**Doctor of Philosophy (Ph.D.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

Applicants who are seeking admission to School of Graduate Studies must meet all of the minimum general School of Graduate Studies admission requirements identified in the graduate catalog. In addition, prospective students must fulfill the requirements for admission to the graduate program in Physics and Astrophysics.

1. Successful completion of a master’s degree (Some programs permit bypassing the master’s degree and allow for direct admission to the Ph.D. degree. Check specific department requirements for admission.)
2. An overall GPA of 3.0 for all graduate work.
3. Completed all undergraduate preparation.
4. Presentation of scores on the GRE General Test and advanced physics test is recommended.
5. Be recommended for doctoral work by the department.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physics and Astrophysics Department.

The degree is a research degree and is conferred only in recognition of high achievement in independent scientific research and scholarship.

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate.
3. With approval of a student’s Faculty Advisory Committee, up to one-half of the work beyond a master’s degree (maximum of 30 semester credit hours) may be transferred from another institution that offers post-master’s degrees in the discipline.
4. In addition to PHYS 590 Research, the coursework will amount to approximately 36 hours.

5. Completion of a regular core of courses which includes:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 509</td>
<td>Methods of Theoretical Physics</td>
<td>3</td>
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<tr>
<td>PHYS 510</td>
<td>Methods of Theoretical Physics</td>
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<tr>
<td>PHYS 539</td>
<td>Quantum Mechanics</td>
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<td>PHYS 540</td>
<td>Quantum Mechanics</td>
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<tr>
<td>PHYS 541</td>
<td>Theory Electricity Magnetism</td>
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<td>PHYS 542</td>
<td>Theory of Electricity and Magnetism</td>
<td>3</td>
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<tr>
<td>PHYS 543</td>
<td>Statistical Physics</td>
<td>3</td>
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<tr>
<td>PHYS 545</td>
<td>Analytical Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 549</td>
<td>Seminar</td>
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6. Completion of several specialized graduate level courses in physics in order to obtain the in-depth training essential for the development of their research interest.

7. Completion of at least nine semester hours of graduate work, (400 level or above) in a single related field.

8. After successful completion of the first two semesters of coursework, students who entered the program with a bachelor's degree will take a written qualifying examination, which covers undergraduate and first-year graduate level courses. Students with a master's degree will take this examination in the second semester of enrollment.

9. A student who fails to perform satisfactorily in this examination may be re-examined after waiting one semester. In general, no student will be allowed to take the qualifying examination more than twice.

10. No student may proceed formally toward the Ph.D. degree until this examination has been passed.

11. Written doctoral comprehensive examination in physics will normally be taken in the fifth semester of graduate enrollment. This must be completed before advancement to candidacy is granted.

12. Candidates for the Ph.D. must complete a research investigation. Upon satisfactory completion of the research investigation, the student is required to prepare a dissertation covering the research.

At the final oral examination, the candidate presents and defends the dissertation.

Five-Year B.S.-M.S. Degree

Five-year B.S.-M.S. Degree Program in Physics

The program will use only the existing courses in the Department of Physics and Astrophysics, Department of Mathematics, and Department of Chemistry.

The program course requirements include the following courses:

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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 251C</td>
<td>University Physics I</td>
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<td>PHYS 251CL</td>
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<td>PHYS 252C</td>
<td>University Physics II</td>
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<td>PHYS 252CL</td>
<td>University Physics II Lab</td>
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<td>PHYS 253C</td>
<td>University Physics III</td>
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<td>University Physics III Lab</td>
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<tr>
<td>PHYS 317</td>
<td>Mechanics I</td>
<td>3</td>
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<td>PHYS 318</td>
<td>Mechanics II</td>
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<tr>
<td>PHYS 324</td>
<td>Thermal Physics</td>
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<td>PHYS 325</td>
<td>Optics</td>
<td>3</td>
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<td>PHYS 325L</td>
<td>Optics Laboratory</td>
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<tr>
<td>PHYS 327</td>
<td>Electricity and Magnetism I</td>
<td>3</td>
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<tr>
<td>PHYS 328</td>
<td>Electricity and Magnetism II</td>
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<td>PHYS 415</td>
<td>Undergrad Research Experience</td>
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<td>PHYS 428</td>
<td>Advanced Physics Laboratory</td>
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<td>PHYS 431</td>
<td>Quantum Mechanics I</td>
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<td>PHYS 432</td>
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<td>PHYS 509</td>
<td>Methods of Theoretical Physics</td>
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<td>PHYS 510</td>
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<td>PHYS 539</td>
<td>Quantum Mechanics</td>
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<tr>
<td>PHYS 541</td>
<td>Theory Electricity Magnetism</td>
<td>3</td>
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<tr>
<td>PHYS 542</td>
<td>Theory of Electricity and Magnetism</td>
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<td>PHYS 545</td>
<td>Analytical Mechanics</td>
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<td>PHYS 590</td>
<td>Research</td>
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<td>MATH 165</td>
<td>Calculus I</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 352</td>
<td>Introduction to Partial Differential Equations</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</td>
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<td>CHEM 122</td>
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<td>CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
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</tbody>
</table>

Total Credits: 92-107

Courses

**PHYS 509. Methods of Theoretical Physics. 3 Credits.**
An introduction to the mathematical methods currently used in physics.

**PHYS 510. Methods of Theoretical Physics. 3 Credits.**
A continuation of Physics 509 introduction to the mathematical methods currently used in physics.

**PHYS 511A. Physics for Teachers I. 3 Credits.**
Prerequisite: PHYS 511L.

**PHYS 511B. Physics for Teachers I. 3 Credits.**
Prerequisite: PHYS 511A.

**PHYS 511L. Physics for Teachers I Lab. 2 Credits.**
Prerequisite: Department consent.

**PHYS 512A. Physics for Teachers II. 3 Credits.**
Prerequisite: PHYS 512L.

**PHYS 512B. Physics for Teachers II. 3 Credits.**
Prerequisite: PHYS 512A.

**PHYS 512L. Physics for Teachers II Lab. 2 Credits.**
Prerequisites: PHYS 511L and PHYS 511B.

**PHYS 513A. Physics for Teachers III. 3 Credits.**
Prerequisite: PHYS 513L.

**PHYS 513B. Physics for Teachers III. 3 Credits.**
Prerequisite: PHYS 513A.

**PHYS 513L. Physics for Teachers III Lab. 2 Credits.**
Prerequisites: PHYS 512L and PHYS 512B.

**PHYS 520. Cosmology. 3 Credits.**
Cosmology is the study of the origin, structure, and evolution of the Universe. This graduate-level course will provide an overview of recent developments in cosmology, including: the Big Bang model, inflation, the cosmic microwave background, baryogenesis, the expanding universe, Hubble’s constant and the distance scale, and dark energy. On demand.

**PHYS 525. Galaxies. 3 Credits.**
This graduate-level course will provide an overview of the formation and evolution of galaxies. Topics include: galaxy classification, formation of spheroids and disk galaxies, galactic dynamics, interstellar medium, dark matter, mass models, spiral structure formation, large-scale structure, and high redshift galaxies. On demand.

**PHYS 535. Solid State Physics. 3 Credits.**
The crystal lattice, electron theory of metals and semiconductors, and transport phenomena in solids.

**PHYS 536. Solid State Physics II. 3 Credits.**
Lattice vibrations, phonon-electron interactions, and cooperative phenomena in solids.

**PHYS 539. Quantum Mechanics. 3 Credits.**
The Schroedinger equation, perturbation methods, and simple quantum mechanical systems.
PHYS 540. Quantum Mechanics. 3 Credits.
Matrix methods, spin, and scattering phenomena.

PHYS 541. Theory Electricity Magnetism. 3 Credits.
Electrostatics, magnetostatics, electromagnetic waves.

PHYS 542. Theory of Electricity and Magnetism. 3 Credits.
Special theory of relativity, scattering of charged particles, and radiation.

PHYS 543. Statistical Physics. 3 Credits.
The Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics, and their application to the description of physical systems.

PHYS 545. Analytical Mechanics. 3 Credits.
Variational methods. Lagrange's equations, oscillations, Hamilton equations, and special relativity.

PHYS 460. Introduction to Astrophysics. 3 Credits.
Galaxies and the universe. Topics include structure and evolution of galaxies, the Milky Way, stellar populations, globular clusters, interstellar medium, big bang, Hubble and the distance scale, radio galaxies, quasars, jets, blazars, clusters and superclusters of galaxies and cosmology. Some topics include the use of computer tools to solve problems. Prerequisite: PHYS 460 or approval of instructor. S, odd years.

PHYS 499. Dissertation. 1-18 Credits.
Repeatable.

PHYS 590. Research. 1-16 Credits.
Repeatable.

PHYS 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

PHYS 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

PHYS 999. Dissertation. 1-18 Credits.
Repeatable to 18 credits.

Undergraduate Courses for Graduate Credit
PHYS 402. Computers in Physics. 3 Credits.
Computer applications in physics, that may include data analysis, numerical simulation, symbolic and algebraic programming, parallel computing, computer interfacing and/or experimental physics applications. Prerequisites: PHYS 252 and knowledge of a higher-level computer programming language, or consent of instructor. On demand.

PHYS 428. Advanced Physics Laboratory. 2 Credits.
Advanced undergraduate experiments in physics, using modern techniques and instrumentation. Classic experiments leading to the current understanding of physical theory. Prerequisite: PHYS 253 or approval of instructor. F, odd years.

PHYS 431. Quantum Mechanics I. 3 Credits.
An introduction to quantum mechanics with applications to atomic structure. Prerequisite: PHYS 253. Prerequisite or Corequisite: PHYS 317 or approval of department. F, even years.

PHYS 432. Quantum Mechanics II. 3 Credits.
Further development of basic quantum theory with application to atomic, molecular, solid state and nuclear physics. Prerequisite or Corequisite: PHYS 431 or consent of instructor. S, odd years.

PHYS 434. Nuclear Physics. 3 Credits.
Introduction to the theory of atomic nuclei, fundamental forces and sub-atomic particles. Prerequisite: PHYS 253 or approval of instructor. F, odd years.

PHYS 437. Introductory Solid State Physics. 3 Credits.
A general introduction to solid state phenomena. Prerequisite: PHYS 253 or approval of instructor. F, even years.

PHYS 461. Introduction to Astrophysics II. 3 Credits.
Galaxies and the universe. Topics include structure and evolution of galaxies, the Milky Way, stellar populations, globular clusters, interstellar medium, big bang, Hubble and the distance scale, radio galaxies, quasars, jets, blazars, clusters and superclusters of galaxies and cosmology. Some topics include the use of computer tools to solve problems. Prerequisite: PHYS 460 or approval of instructor. S, odd years.

PHYS 492. Special Problems. 1-3 Credits.
Selected problems in physics or astrophysics. Prerequisite: Approval of the department. Repeatable to 9 credits. On demand.

Psychology

http://www.und.edu/dept/psych/

Bradley, Derenne, DiLorenzo, Ferraro, Holm (Chair), Kehn, Kelly, King, Legerski, McDonald, Miller, Petros, Plumm, Poltavski, Ruthig, Terrance, Terrell, Weatherly, and Wise

Degrees Granted: Master of Science (M.S.), Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.)

The Psychology Department in the College of Arts and Sciences at the University of North Dakota offers graduate degrees in Forensic Psychology (M.A. and M.S.), General/Experimental Psychology (Ph.D.), and Clinical Psychology (Ph.D.). The Clinical Psychology program is accredited by the American Psychological Association. The Psychology Department does not admit students who wish to earn only a Master of Arts degree in general psychology without continuation on to the Ph.D. degree in either clinical or general-experimental psychology. Students are admitted directly into the Ph.D. program in clinical or general-experimental psychology and will be awarded a Master of Arts degree in general psychology upon completion of the following requirements:

• Completion of “Scholarly Tool” coursework to develop skills in as well as and;
• Completion of an empirical, 6 credits;
• Completion of a minimum of 20 elective PSYC course credits at the 500-level or above which are approved by the respective advisory committee and documented in the Program of Study. A maximum of eight credits may be transferred from another institution. Fifteen credits must be completed on campus through UND.

A list of all programs offered, including admission requirements, degree requirements and courses offered can be found in the Degree section.

Clinical Psychology Doctor of Philosophy (Ph.D.)

Core Program Faculty: Bradley, Holm (Department Chair), King, Legerski (Director, Psychological Services Center), McDonald (INPSYDE Director), Miller (Director of Clinical Training) and Wise

Associated Program Faculty: Derenne, Ferraro, Kehn, Petros, Plumm, Poltavski, Ruthig, Terrance, Terrell, and Weatherly

Mission Statement and Program Goals

The mission of the Ph.D. program in clinical psychology is to train scientist-practitioners. The scientist-practitioner model of education and training in psychology is an integrative approach to science and practice wherein each must continually inform the other. This model represents more than a summation of both parts. Scientist-practitioner psychologists embody a research orientation in their practice and practice relevance in their research. Thus, a scientist-practitioner is not defined by a job title or a role, but rather by an integrated approach to both science and practice. The model entails development of interlocking skills to foster a career-long process of psychological investigation, assessment, and intervention.
**Goal 1:** The clinical program will recruit qualified and capable students who are committed and prepared to complete program requirements in a timely manner.

**Goal 2:** Graduates of our program will demonstrate a base of knowledge regarding the field of psychology, which extends beyond specialized clinical areas.

**Goal 3:** Graduates of our program will demonstrate an ability to design, conduct, analyze, and disseminate research that advances knowledge regarding the practice of clinical psychology.

**Goal 4:** Graduates of our program will demonstrate knowledge in psychopathology and competency in the delivery of a wide range of clinical assessment and psychotherapy services that are theory based and empirically-supported.

**Goal 5:** Graduates of our program will display ethical and professional conduct with sensitivity to the importance of cultural diversity and individual differences in understanding human psychological functioning.

**Forensic Psychology Master of Science (M.S.)**

**Mission Statement and Program Goals**

The M.S. program is committed to providing quality instruction and training in the field of modern forensic psychology in order to serve those interested in careers in forensic psychology or wanting preparation for doctoral programs in psychology or other professional programs like law school or criminal justice.

1. Establish a solid foundation and background in psychological concepts and skills similar to those offered in many graduate programs in psychology, particularly those with an applied emphasis.
2. Provide students with specific forensic-relevant coursework and experiences.
3. Provide students an opportunity to receive supervised fieldwork in forensic settings.
4. Give students an opportunity to participate in faculty-directed research and conduct their own independent research with a thesis.
5. Prepare students for admission into Ph.D. or Psy.D. graduate programs.

**Forensic Psychology Master of Arts (M.A.)**

**Mission Statement and Program Goals**

The MA program is committed to providing equality instruction and training in the field of modern forensic psychology in order to serve the educational and professional needs of those working or living at a distance from UND.

1. Establish a solid foundational background at the Master’s level in psychological concepts and skills similar to those offered in many graduate programs in psychology, particularly those with an applied emphasis.
2. Provide students with specific forensic-relevant coursework and experiences.
3. Allow students an opportunity to receive supervised fieldwork and/or to do a research project as independent study under the direction of a program faculty.
4. Prepare students for admission into Ph.D. or Psy.D. graduate programs.

**General/Experimental Psychology Doctor of Philosophy (Ph.D.)**

**Core Program Faculty:** Derenne (Program Director), Ferraro, Kehn, Petros, Plumm, Poltavski, Ruthig, Terrance, Terrell, Weatherly

**Mission Statement and Program Goals**

The mission of the University of North Dakota (UND) General/Experimental (G/E) Ph.D. program is to provide quality educational experiences to qualified graduate students that promote critical thinking and creative skills based on the current theory, principles, and methodologies and techniques of experimental psychology. These will be promoted through written as well as oral communication. Graduates of our program will be prepared for careers as academicians at the college and/or university level, researchers in private industry and education, and/or teachers at the college and/or university level and will all show continued evidence of expertise within their various specialization in G/E psychology. G/E students should anticipate and expect broad exposure to a variety of issues and topics in the field of experimental psychology and, as a result, each student is expected to establish a firm theoretical and academic foundation that will support their later pursuit of more specialized academic interests. This will be in evidence via a broad breadth of knowledge appropriate to receiving a MA and/or PhD in General/Experimental Psychology. The G/E faculty have two specific goals in mind for students; these include:

**Goal 1:** Students of the G/E program will demonstrate a base of knowledge regarding the field of experimental psychology, which will extend beyond specialized experimental areas.

**Goal 2:** Students of the G/E program will demonstrate ability to design, conduct, analyze, and report/disseminate research that advances the scientific study of psychology.

**Master of Arts (M.A.)**

**Admission Requirements**

1. A four-year bachelor’s degree from a recognized college or university. For U.S. degrees, accreditation must be by one of the six regional accrediting associations.
2. Eighteen (18) hours of undergraduate work in psychology including a course in General Psychology, Developmental, Abnormal, Statistics, and Experimental Psychology.
3. A cumulative Grade Point Average (GPA) of at least 3.50 for the junior and senior years of undergraduate work (based on A+= 4.00).
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. A year of biological science (biology, physiology, etc.).
6. A semester of college algebra.
7. General background in other social and natural sciences also recommended.
8. Graduate Record Examination—30th percentile or higher on Verbal and Quantitative and 2.5 or higher on Analytic Writing and Subject.

**Degree Requirements**

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Psychology Department.

The Psychology Department does not admit students who wish to earn only a Master of Arts degree in general psychology without continuation on to the Ph.D. degree in either clinical or general-experimental psychology. Students enrolled in the Ph.D. program in clinical or general-experimental psychology will be awarded a Master of Arts degree in general psychology upon completion of the following requirements:

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. A maximum of eight credit hours required for the degree may be transferred from another institution.
3. Completion of “Scholarly Tool” coursework to develop skills in research design including:
   - PSYC 541 Advanced Univariate Statistics 3
   - PSYC 542 Multivariate Statistics for Psychology 3
   - PSYC 543 Experimental Design 3
4. Completion of an empirical thesis (, 6 credits)
5. Completion of a minimum of 15 elective PSYC course credits at the 500-level or above which are approved by the respective advisory committee and documented in the Program of Study. Fifteen credits must be completed on campus through UND.
Clinical Psychology Doctor of Philosophy (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university. For U.S. degrees, accreditation must be by one of the six regional accrediting associations.
2. Eighteen (18) hours of undergraduate work in psychology including a course in General Psychology, Developmental, Abnormal, Statistics, and Experimental Psychology.
3. A cumulative Grade Point Average (GPA) of at least 3.2 for all undergraduate work.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. A year of biological science (biology, physiology, etc.).
6. A semester of college algebra.
7. General background in other social and natural sciences also recommended.
8. Graduate Record Examination—30th percentile or higher on Verbal, Quantitative, and Analytic Writing.

Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Psychology Department.

1. Minimum of 60 credit hours beyond 30 credits from M.A. degree work is required for the Ph.D. (minimum of 90 credit hours total).
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Completion of “Scholarly Tool” coursework to develop skills in research design including:
   - PSYC 541 Advanced Univariate Statistics 3
   - PSYC 542 Multivariate Statistics for Psychology 3
   - PSYC 543 Experimental Design 3
4. Completion of an empirical dissertation;
5. Graduate students in the clinical psychology Ph.D. program are required to meet a number of eligibility criteria to take comprehensive exams and establish candidacy for the Ph.D. degree. An assessment will be conducted after the student successfully completes all of the requirements for the Master of Arts degree in general psychology. To remain in the Ph.D. program and proceed on to comprehensive exams, practicum assignments, dissertation research, and remaining coursework, the student must have:
   a. earned a cumulative graduate grade point average of at least 3.5;
   b. completed his or her M.A. degree within three years of enrollment;
   c. gained the approval of a majority of the core and associated faculty of the clinical psychology doctoral program.
   Students failing to meet one or more of these requirements will be terminated from the Ph.D. program in clinical psychology.
6. Completion of the comprehensive examination for the Ph.D. in Clinical Psychology.
7. Completion of the following for the Ph.D. in Clinical Psychology:
   - One calendar year of full-time internship (usually during the fifth year) 3
   - Practicum experience which includes
     - PSYC 580 Clinical Practice 8
     - PSYC 587 Supervised Field Work 13
   - Clinical coursework
     - PSYC 570 Clinical Assessment I: Basic Issues in Clinical Assessment 4
     - PSYC 571 Clinical Assessment II: Advanced Issues in Clinical Assessment 4
     - PSYC 573 Theories of Psychotherapy 3

Forensic Psychology Master of Science (M.S.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. Applicants must have a baccalaureate degree from an accredited college or university with a behavioral or social science major allied with psychology, e.g., psychology, criminal justice, sociology, counseling, and social work.
2. Applicants must have a cumulative undergraduate GPA of 3.2 or above or a graduate degree GPA of 3.5.
3. Applicant must also submit GRE scores, with Verbal, Quantitative, and Analytic Writing scores meeting or exceeding the 30th percentile. Applicants not meeting these standards may be admitted on a provisional basis with continued enrollment contingent on successful performance in the program.
4. A personal statement discussing:
   a. academic and professional accomplishments;
   b. reasons for pursuing a graduate degree in Forensic Psychology;
   c. research interests; and
   d. any additional information the applicant would like the admission committee to know.
5. A curriculum vitae summarizing relevant experiences including but not limited to academic course work and work, volunteer, and research activities.
6. Three letters of recommendation from those who can comment on the applicant’s academic abilities are also required. Consideration will be given for experience working in forensic areas or participating in research as an assistant prior to the program application.
7. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PSYC 574</td>
<td>Advanced Therapeutic Interventions</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 575</td>
<td>Behavior Pathology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 579</td>
<td>Professional Issues and Ethics in Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 594</td>
<td>Special Topics in Psychology</td>
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Foundation coursework in

<table>
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<tr>
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<tbody>
<tr>
<td>PSYC 505</td>
<td>History of Psychology</td>
<td>3</td>
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<tr>
<td>PSYC 560</td>
<td>Advanced Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 535</td>
<td>Physiological Psychology</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 537</td>
<td>Physiology of Behavior and Psychophysiological Measurement</td>
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Cognitive/affective bases of behavior

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>PSYC 533</td>
<td>Theories of Learning</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 539</td>
<td>Cognitive Psychology</td>
<td></td>
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Developmental Basis of Behavior

<table>
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<tr>
<th>Course Code</th>
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<td>PSYC 576</td>
<td>Child Psychopathology and Treatment</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 551</td>
<td>Advanced Developmental Psych</td>
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Diversity Elective

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 521</td>
<td>Diversity Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

Research Credits

<table>
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<tr>
<th>Category</th>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s Thesis</td>
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<td>6</td>
</tr>
<tr>
<td>Dissertation</td>
<td></td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Total Credits 83
The applicant must meet the School of Graduate Studies' current minimum admission requirements as published in the graduate catalog. Students in the M.S. Forensic Psychology Program at UND are required to complete 45 credits. This includes 27 credits of required coursework, 12 credits of elective courses, and a minimum of 6 credit hours for thesis work. The Forensic Psychology program does not have a comprehensive examination. Required Core Courses (27 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 520</td>
<td>Foundations of Forensic Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 521</td>
<td>Diversity Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 523</td>
<td>Forensic Assessment</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 524</td>
<td>Psychology and Law</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 541</td>
<td>Advanced Univariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 542</td>
<td>Multivariate Statistics for Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 543</td>
<td>Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 575</td>
<td>Behavior Pathology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 593</td>
<td>Readings in Psychology</td>
<td>1-3</td>
</tr>
<tr>
<td>PSYC 998</td>
<td>Thesis</td>
<td>1-9</td>
</tr>
</tbody>
</table>

Elective Courses (12 credits):

Choose four of the following:

- PSYC 501 Psychological Foundations Educ
- PSYC 526 Psychological Profiling and Criminal Behavior
- PSYC 539 Cognitive Psychology
- PSYC 560 Advanced Social Psychology
- PSYC 576 Child Psychopathology and Treatment
- PSYC 587 Supervised Field Work
- PSYC 594 Special Topics in Psychology
- PSYC 594 Special Topics in Psychology
- CJ 515 Human Nature and Crime
- CJ 535 Seminar in Juvenile Justice
- CJ 565 Victimology

Elective Courses (9 credits):

Choose 3 of the following:

- PSYC 501 Psychological Foundations Educ
- PSYC 526 Psychological Profiling and Criminal Behavior
- PSYC 539 Cognitive Psychology
- PSYC 576 Child Psychopathology and Treatment
- PSYC 587 Supervised Field Work
- PSYC 594 Special Topics in Psychology
- PSYC 594 Special Topics in Psychology
- PSYC 594 Special Topics in Psychology

Note: The student’s Advisory Committee will also consider other graduate classes as appropriate electives on a case-by-case basis. Students who have a strong psychology undergraduate background may, after review by the Committee, be permitted to substitute an appropriate forensic psychology class.

**Forensic Psychology Master of Arts (M.A.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A baccalaureate degree from an accredited college or university with a behavioral or social science major allied with psychology, i.e., psychology, criminal justice, sociology, counseling or social work.
2. A cumulative undergraduate grade point average (GPA) of 3.0 or above, or a graduate degree GPA of 3.50.
3. Submission of a curriculum vitae and a personal statement describing:
   a. academic and professional accomplishments;
   b. reasons for pursuing a graduate degree in Forensic Psychology; and
   c. any additional information the applicant would like the admission committee to know.
4. Submission of three letters of recommendation from those who can comment on your academic abilities or ability to understand complex issues and think critically, e.g., former faculty member or work supervisor.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**

Students seeking the Master of Science or Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Forensic Psychology program.

The general degree requirements for the Master of Arts degree in the Forensic Psychology include a minimum of 35 credits of coursework:

Required Core Courses (26 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PSYC 520</td>
<td>Foundations of Forensic Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 521</td>
<td>Diversity Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 524</td>
<td>Psychology and Law</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 528</td>
<td>Forensic Psychology Capstone (summer, immediately prior to graduation, 2 week course, one week of which is on campus)</td>
<td>2</td>
</tr>
<tr>
<td>PSYC 541</td>
<td>Advanced Univariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 542</td>
<td>Multivariate Statistics for Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 543</td>
<td>Experimental Design</td>
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</tr>
<tr>
<td>PSYC 575</td>
<td>Behavior Pathology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 593</td>
<td>Readings in Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 997</td>
<td>Independent Study (research or practicum experience possible)</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Courses (9 credits):

Choose 3 of the following:

- PSYC 526 Psychological Profiling and Criminal Behavior
- PSYC 539 Cognitive Psychology
- PSYC 535 Child Psychopathology and Treatment
- PSYC 587 Supervised Field Work
- PSYC 594 Special Topics in Psychology
- PSYC 594 Special Topics in Psychology
- PSYC 594 Special Topics in Psychology

Total Credits: 35

Note: The student’s Advisory Committee, in consultation with the candidate, will also consider other graduate classes as appropriate electives on a case-by-case basis. Students who have a strong psychology background may, after review by the Committee, be permitted to substitute an appropriate forensic psychology course for a required program course. A maximum of eight graduate credits may be transferred from another institution.

**General/Experimental Psychology Doctor of Philosophy (Ph.D.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university. For U.S. degrees, accreditation must be by one of the six regional accrediting associations.
2. A cumulative Grade Point Average (GPA) of at least 3.20 for all undergraduate work.
3. Graduate Record Examination—30th percentile or higher on Verbal, Quantitative, and Analytic Writing.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. A year of biological science (biology, physiology, etc.).
6. A semester of college algebra.
7. General background in other social and natural sciences also recommended.

**Degree Requirements**

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Psychology Department.
Minor in Psychology

Graduate students taking major work in other departments and graduate minor work in psychology for a master’s degree should have the equivalent of an undergraduate minor in psychology with the following specific courses: Introduction to Psychology, Developmental Psychology, Abnormal Psychology (or the equivalent). Any of the psychology courses, which carry graduate credit, are acceptable for the graduate minor.

Graduate students taking major work in another department and minor work in psychology for a doctoral degree, in addition to having the undergraduate preparation noted in the paragraph above, must also have completed a course in statistics and an undergraduate laboratory course in Experimental Psychology. No specific courses are required for the graduate minor except that all credits for the minor must be 500-level credits.

Courses

PSYC 501. Psychological Foundations Educ. 3 Credits.
A study of the learning process with secondary emphasis on how the learning process is affected by individual differences, growth, development, and personality. Prerequisite: Graduate standing in Psychology or Education.

PSYC 505. History of Psychology. 3 Credits.
Historical development of modern psychology with an emphasis on experimental and systematic phases of early psychological thought, on important issues during the growth of psychology, and on current trends. Prerequisite: Graduate standing in Psychology or Counseling.

PSYC 520. Foundations of Forensic Psychology. 3 Credits.
Prerequisite: Graduate status in Psychology or permission of instructor.

PSYC 521. Diversity Psychology. 3 Credits.
The purpose of this course is to provide students with an advanced consideration of the major issues in the study of diversity as it applies to the field of psychology. Prerequisite: Graduate status in Psychology or permission of instructor.

PSYC 523. Forensic Assessment. 3 Credits.
This course is designed to provide students with 1) a review of assessment measures used in forensic assessment 2) an in-depth study of ethical and professional issues in forensic assessment, and 3) training in writing assessment reports. Prerequisite: Graduate status in Psychology or permission of instructor. SS, even years.

PSYC 524. Psychology and Law. 3 Credits.
An in-depth examination of the interaction between the disciplines of psychology and law. The course will look at how psychological research and theories are applied to contemporary legal issues. Prerequisite: Graduate status in Psychology or permission of instructor.

PSYC 525. Psychological Profiling and Clinical Behavior. 3 Credits.
Prerequisite: Graduate status in Psychology or permission of instructor.

PSYC 528. Forensic Psychology Capstone. 2 Credits.
Prerequisites: Graduate status in MA Forensic Psychology, PSYC 997, and expected graduation of the summer semester the course is taken.

PSYC 533. Theories of Learning. 3 Credits.
Examination of the evidences in support of the various systematic theories of learning. Prerequisite: Graduate standing in Counseling or Psychology or consent of instructor.

PSYC 537. Physiology of Behavior and Psychophysiological Measurement. 3 Credits.
This is an advanced graduate course covering major topics of physiological psychology while also introducing measurement techniques traditionally used in psychophysiological research. While physiology and anatomy of the central and peripheral nervous systems will be reviewed in this course, students are expected to have basic knowledge of neuroscience, behavioral science, and research methodology. Experiential learning activities will focus on the demonstration and practice of psychophysiological measurement and recording techniques, data analysis, and interpretation. Prerequisite: Graduate standing in Psychology or permission of instructor.

PSYC 538. Cognitive Psychology. 3 Credits.
An in-depth analysis and discussion (including laboratory work) of topics covering issues related to memory, attention, problem solving, comprehension, and thinking. Prerequisite: Graduate standing in Psychology or permission of instructor.

PSYC 541. Advanced Univariate Statistics. 3 Credits.
Theory of univariate statistics; application to quantitative data in psychology. Prerequisites: Graduate standing, college algebra, and elementary statistics.

PSYC 542. Multivariate Statistics for Psychology. 3 Credits.
The appropriate use and interpretation of multivariate data analytic techniques in psychology. Prerequisites: Graduate standing and PSYC 541.

PSYC 543. Experimental Design. 3 Credits.
Application of statistics and probability theory to the design and analysis of experiments. Prerequisite: PSYC 541 or consent of instructor.

PSYC 551. Advanced Developmental Psych. 3 Credits.
In-depth analysis and integration of theories and theorists relevant for current issues in lifespan developmental psychology. Prerequisite: Graduate status in Psychology or permission of instructor.

PSYC 560. Advanced Social Psychology. 3 Credits.
In-depth examination of the theoretical and empirical literature in social psychology focusing on attitudes, stereotyping and prejudice, interpersonal relationships, social cognition, personality and the self, and group behavior. Also includes additional course readings and written work beyond the requirements for Psychology 460. Prerequisite: Graduate status in Psychology or permission of instructor. S.

PSYC 565. Multicultural Psychology. 3 Credits.
Examinations of cross-cultural work in psychology with attention to race, ethnicity, and culture. Special emphasis is given to research, training, and treatment issues with minority groups, including the American Indian and other cultural groups. Prerequisite: Graduate status in Psychology.
PSYC 570. Clinical Assessment I: Basic Issues in Clinical Assessment. 4 Credits.
Provides the conceptual and practical frameworks upon which to build expertise in the assessment and prediction of human behavior in relation to intellectual indices and interviewing skills. Serves as a graduate foundation to explore, analyze, and discuss basic and applied issues relevant to psychological testing, the administration and interpretation of widely-used intellectual assessment instruments, and the opportunity to develop structured clinical interviewing techniques. Prerequisite: Clinical Psychology graduate status or consent of instructor.

PSYC 571. Clinical Assessment II: Advanced Issues in Clinical Assessment. 4 Credits.
Provides the conceptual and practical frameworks upon which to build expertise in the assessment and prediction of human behavior in relation to personality assessment, behavioral assessment, neuropsychological assessment, and the assessment of high incidence behavioral disorders. Skills in report writing and case conference presentation will also be developed. Prerequisites: PSYC 570 and/or consent of instructor.

PSYC 572. Community Psychology. 3 Credits.
Theories and practice in community mental health consultation. Credits in 587 may be earned in conjunction with this course. Prerequisites: PSYC 571, PSYC 573, and graduate standing in Psychology.

PSYC 573. Theories of Psychotherapy. 3 Credits.
Theory and practice in individual psychotherapy, with emphasis on systematic comparison of major theoretical viewpoints. Prerequisite or Corequisite: PSYC 571 and/or consent of instructor.

PSYC 574. Advanced Therapeutic Interventions. 3 Credits.
An in-depth study of the key issues of psychotherapy research with a focus on critical evaluation of the psychotherapy research literature and the development of knowledge of empirically supported approaches to psychotherapy with specific problems. Prerequisite: PSYC 573 or permission of instructor.

PSYC 575. Behavior Pathology. 3 Credits.
A survey of various forms of behavior pathology with emphasis upon current research and theories relating to pathology. Prerequisite: Graduate standing in psychology or instructor permission. F.

PSYC 576. Child Psychopathology and Treatment. 3 Credits.
An overview of child and developmental psychopathology including discussion of pertinent treatments for disorders such as conduct disorders, attention-deficit, substance abuse, and developmental disabilities. Prerequisites: PSYC 570 and PSYC 575, or instructor permission.

PSYC 579. Professional Issues and Ethics in Psychology. 3 Credits.
An exploration of ethical issues pertinent to the science and practice of psychology and discussion of current professional issues facing psychology. Prerequisites: Graduate standing in Psychology or permission of instructor.

PSYC 580. Clinical Practice. 1-3 Credits.
Supervised individual practice in techniques of individual psychotherapy, marital therapy, counseling, and guidance of parents and children, and administration of psychological examinations, behavior modification, community mental health procedures, consultation, and other professional practices of the clinical psychologist. Prerequisites: PSYC 571, graduate standing in Psychology, and consent of instructor. Repeatable. S/U grading.

PSYC 587. Supervised Field Work. 1-3 Credits.
Used primarily for individualized field placement so that the student may acquire practicum experiences in clinical settings, community psychology, and group methods. Prerequisites: Graduate standing in Psychology and consent of instructor. Repeatable. S/U grading.

PSYC 593. Readings in Psychology. 1-3 Credits.
Prerequisites: Advanced standing in Psychology and consent of instructor. Repeatable.

PSYC 594. Special Topics in Psychology. 1-3 Credits.
Topical courses in Psychology organized on a semester-by-semester basis. Prerequisites: Graduate standing in Psychology or permission of instructor. Repeatable. On demand.

PSYC 595. Seminar in Psychology. 1-3 Credits.
Prerequisites: Consent of instructor.

PSYC 596. Individual Research. 1-6 Credits.
Repeatable.

PSYC 996. Continuing Enrollment. 1-12 Credits.
Repeatable.

PSYC 997. Independent Study. 3 Credits.
The independent study is designed to require the student independently to investigate a topic related to the field of forensic psychology. The study need not be an original contribution to knowledge but may be a presentation, analysis, and discussion of information and ideas already in the literature. The requirement for independent study is to ensure that a student can investigate a topic and organize a scholarly report on the investigation. Prerequisite: Graduate status in the Master of Arts. F, S, SS.

PSYC 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

PSYC 999. Dissertation. 1-18 Credits.
Repeatable to 18 credits.

Public Administration

http://business.und.edu/undergraduate/political-science-public-administration/index.cfm

FACULTY: Hand, Harsell (Graduate Program Director), Hultquist, Jendrysik, Jensen, Light, Scheurer, Schuller, Sum (Chair), Urlacher, and Wood

Degree Granted: Master of Public Administration (M.P.A.)

The purposes of the M.P.A. program are to prepare students for positions in the public service, non-profit, and health sectors and to increase the skills of persons already in those areas. The program achieves these purposes through a multidisciplinary curriculum that requires the students to have a basic understanding of the American political system, instructs the students on the fundamental concepts of public administration, and prepares the students to apply basic administrative principles in public management. The department offers a joint MPA/JD with the School of Law, three certificate programs: a multidisciplinary Certificate in Social Entrepreneurship, and a combined BSPA/MPA or a BA/MPA program for students who meet the admission criteria.

A list of all programs offered, including admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Public Administration (M.P.A.)

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor's degree from a recognized college or university.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work based on A=4.00.
3. Graduate Record Examination (GRE) General test or, the Graduate Management Admission Test (GMAT).
4. Satisfy the School of Graduate Studies' English Language Proficiency requirement for independent study is to ensure that a student can investigate a topic and organize a scholarly report on the investigation. Prerequisite: Graduate status in the Master of Arts. F, S, SS.

PSYC 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

PSYC 999. Dissertation. 1-18 Credits.
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3. Graduate Record Examination (GRE) General test or, the Graduate Management Admission Test (GMAT).
4. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.
5. Minimum competence in public administration, administrative sciences, and methodology. This competence is normally demonstrated by at least one course in each of five fields (Political Science, Accounting, Economics, Management, and Statistics), by special exams in the fields, or by practical experience.
6. Twenty hours in the social sciences, business administration, and related fields.
7. Students who do not meet requirements, 5 and 6, will be given the opportunity to fulfill them.

Master of Public Administration (M.P.A.)

Degree Requirements

Students seeking the Master degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Master of Public Administration Program.
1. A minimum of 34 semester credits.
2. A minimum of 27 credits in public administration and up to 9 credits in cognate fields to total 36 credits.
3. At least one-half of the credits must be at the 500 level.
4. A maximum of nine credits may be transferred to UND from other institutions.

5. **Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 500</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 501</td>
<td>Political and Public Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>POLS 531</td>
<td>Foundations of Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 580</td>
<td>Administrative Internship</td>
<td>3</td>
</tr>
<tr>
<td>POLS 532</td>
<td>Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>POLS 599</td>
<td>Master of Public Administration Capstone</td>
<td>1</td>
</tr>
<tr>
<td>POLS 997</td>
<td>Independent Study</td>
<td>3</td>
</tr>
<tr>
<td>POLS Electives or cognate/elective courses</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

6. **General Track**

Select a total of 9 credits from the following list, including one course from Cluster 1 and one course from Cluster 2

**Cluster 1:**
- POLS 533 Administrative Ethics in the Public Sector
- POLS 535 Public Organizations
- POLS 536 Public Personnel Administration
- POLS 537 Program Evaluation
- POLS 538 Public Budgeting and Financial Administration

**Cluster 2:**
- POLS 502 Seminar/Problems in State and Local Governments
- POLS 503 Government and Business
- POLS 539 Administrative Law
- POLS 562 Political Advocacy and Social Entrepreneurship

6. **Health Administration Track**

Select a total of 12 credits from the following list (Note: Health Administration Track students will substitute one of these courses for 3 credits of POLS/cognate electives).

- POLS 551 Health Administration and Organization
- POLS 552 Health Policy
- ECON 575 Advanced Special Topics
- LAW 303 *
- MPH 504 Leading and Managing Public Health Systems **

6. **Social Entrepreneurship Track**

(Note: Social Entrepreneurship Track students will substitute one of these courses for 3 credits of POLS/cognate electives.)

- SOC 569 Introduction to Social Entrepreneurship
- POLS 561 Creation and Management of Social Enterprises
- POLS 562 Political Advocacy and Social Entrepreneurship
- ENTR 580 Seminar in Social Entrepreneurship

* also offered as POLS 593 Problems in Political Science and Public Administration: Legal & Ethical Issues in Health Administration
** also offered as POLS 593 Problems in Political Science and Public Administration: Leading and Managing Health Systems

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**Residence Requirement**

There is no residence requirement for the M.P.A. degree; however, at least one-half of the credits for the degree must be taken on campus or as an admitted distance degree student.

**Independent Study**

The independent study is designed to require the student to investigate independently a topic related to the field of public administration. The study need not be an original contribution to knowledge but may be a presentation, analysis, and discussion of information and ideas already in the literature of the field. The requirement is to ensure that a student can investigate a topic and organize a scholarly report on the investigation.

The topic for an independent study must be approved by the student’s advisor. Approval is effected by the student’s completing a form titled Proposal of Independent Study, available from the School of Graduate Studies, then submitting the proposal to the advisor for approval. The proposal, which should be approved no later than the beginning of the semester or session in which the student expects to graduate, must be filed in the School of Graduate Studies before a student is advanced to candidacy for a master’s degree.

Each student must prepare and secure the advisor’s approval of an independent study proposal. The proposal must be completed and submitted for approval by the advisor, who will certify completion of the report to the School of Graduate Studies by the deadline specified in the Academic Calendar.

**Candidacy for the Degree**

Admission of a student to the School of Graduate Studies as a degree student in Approved Status implies only that the student has met minimum entrance requirements and will be permitted to take graduate courses, which normally may be expected to lead to a degree. The student has not been admitted as a candidate for a degree. Advancement to candidacy can be granted only after the student has met certain academic requirements in approximately the following sequence:

1. Completion of 12 semester credits.
2. A GPA of at least 3.00 for all work attempted.
3. The appointment of an advisor. The advisor, who must be a member of the Graduate Faculty, will be appointed by the Dean upon the written recommendation of the M.P.A. program director. The advisor is responsible to the department and the School of Graduate Studies for the supervision of the student’s work.
4. Approval of a Program of Study on a form available from the School of Graduate Studies. The program, which should be developed in consultation with the advisor, must carry the signature of the student, the advisor, and the program director and must be submitted to the Dean of the School of Graduate Studies for approval.
5. Approval of a topic for the independent study by having the advisor sign the Proposal of Independent Study and submitting the Proposal and three copies to the School of Graduate Studies.

The student and the advisor will be notified in writing of the advancement to candidacy. Students must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.

**Final Examinations**

Candidates must pass a written final comprehensive examination, which must cover the coursework included in the program of study. The results will be certified to the School of Graduate Studies by the advisor and the program director on the form Final Report on Candidate by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) required for the degree will be arranged for by the advisor and given and evaluated by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Comprehensive examinations that are failed may be repeated only with the approval of the advisor, the program director, and the dean, but in no event earlier than at the next regularly scheduled offering.
Master of Public Administration (M.P.A.)/Juris Doctor Combined Degree Program

Admission Requirements

1. Students are required to apply to both the Law School and the School of Graduate Studies and indicate that they wish to be admitted to the joint MPA/JD track. This admission will be determined by the Director of the M.P.A. Program and the Dean of the Law School or their designees.

2. Acceptance to the joint program track requires a minimum overall undergraduate GPA of 3.00 or a GPA of 3.25 in the last two academic years.

Sample Curricular Plan

<table>
<thead>
<tr>
<th>Year One</th>
<th>Law School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Two</td>
<td>Law School w/two MPA courses</td>
</tr>
<tr>
<td>Year Three</td>
<td>Law School w/two MPA courses</td>
</tr>
<tr>
<td>Year Four</td>
<td>Six MPA courses + Independent Study or Seven MPA courses</td>
</tr>
<tr>
<td>Year Four</td>
<td>Law School w/one MPA course + Independent Study</td>
</tr>
</tbody>
</table>

* 2 MPA course requirements could be met with Law courses as cognates.

The total credits required for each degree will be unchanged, because each program will accept six credits toward the other degree. Students must be enrolled in the Law School for at least three years; therefore, students wishing to receive both degrees in less than four years should enroll first in the Law School.

Below is a list of Law School courses that can be used as cognates in the MPA program, and MPA courses that can be used as electives in the JD program.

Joint MPA/JD Complementary Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAW 150</td>
<td>M.P.A. Foundation Seminar</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 201</td>
<td>M.P.A. Seminar - Public Administration</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 203</td>
<td>M.P.A. Seminar - Public Budgeting and Financial Administration</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 206</td>
<td>M.P.A. Seminar - State Constitutional Law</td>
<td>2-4</td>
</tr>
<tr>
<td>LAW 210</td>
<td>M.P.A. Seminar - Public Budgeting and Financial Administration</td>
<td>3-5</td>
</tr>
<tr>
<td>LAW 238</td>
<td>M.P.A. Seminar - Foundations of Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>LAW 263</td>
<td>M.P.A. Seminar - Seminar: Legislative and Executive Processes</td>
<td>3</td>
</tr>
<tr>
<td>LAW 277</td>
<td>M.P.A. Seminar - Seminar: Local Governmental Administration</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 281</td>
<td>M.P.A. Seminar - Seminar: Policy Problems in State and Local Governments</td>
<td>3</td>
</tr>
<tr>
<td>LAW 289</td>
<td>M.P.A. Seminar - Seminar: Policy Problems in State and Local Governments</td>
<td>3</td>
</tr>
<tr>
<td>LAW 291</td>
<td>M.P.A. Seminar - Poverty Law</td>
<td>1-4</td>
</tr>
<tr>
<td>LAW 291</td>
<td>M.P.A. Seminar - Civil Rights</td>
<td>1-4</td>
</tr>
<tr>
<td>LAW 291</td>
<td>M.P.A. Seminar - State Constitutional Law</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Or other courses with the approval of the MPA Director and Graduate Dean

Political Science and Public Administration

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 502</td>
<td>Seminar-Problems in State and Local Governments</td>
<td>3</td>
</tr>
<tr>
<td>POLS 508</td>
<td>Seminar-Legislative and Executive Processes</td>
<td>3</td>
</tr>
<tr>
<td>POLS 531</td>
<td>Foundations of Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 532</td>
<td>Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>POLS 535</td>
<td>Public Organizations</td>
<td>3</td>
</tr>
<tr>
<td>POLS 536</td>
<td>Public Personnel Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 538</td>
<td>Public Budgeting and Financial Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 539</td>
<td>Administrative Law</td>
<td>3</td>
</tr>
</tbody>
</table>

Or other courses with the approval of the Dean of the Law School.

Combined Degree Program B.S.P.A./M.P.A. or B.A. in Political Science/M.P.A.

The Public Administration program offers two combined programs, a B.S.P.A./M.P.A. or a B.A. in Political Science/M.P.A. The intent of the combined programs is to allow qualified students to complete the requirements for both degrees in one year beyond that required to receive the baccalaureate degree. Students may apply for this program upon completion of 90 credits toward the Bachelor’s degree but prior to their fourth year of academic work. All requirements for both degrees must be met, and up to six credits of prior-approved coursework may be double-counted toward each of the two degrees. Double-counted credits may not include required courses for the B.S.P.A. or B.A. degree, but may include appropriate elective coursework, preferably at the 500-level or above.

5-year B.A. in Political Science or B.S.P.A. in Public Administration/M.P.A.

Admission Requirements

1. A 3.25 GPA overall and in major.
2. Graduate Record Examination or the Graduate Management Admission Test.
3. Completion of 90 credit hours prior to year four.
4. Minimum competence in public administration, policy, administrative services, and methodology. This competence is normally demonstrated by at least one course in each of the five fields (Public Policy, Accounting, Economics, Management, and Statistics), by special exams in the fields, or by practical experience.
5. Twenty hours in social sciences, business administration and related fields.
6. Students who do not meet requirements 4 and 5 will be given the opportunity to fulfill them.

Degree Requirements

1. A minimum of 36 semester credits (6 credits may be part of undergraduate degree program but taken for graduate credit).
2. A minimum of 26 credits in public administration and up to 9 credits in cognate fields to total 35 credits.
3. At least one-half must be at the 500-level.
4. A maximum of 9 credits may be transferred to UND from other institutions.

Certificate Programs in Public and Health Administration

Three certificate programs are also offered. Each program consists of four three-credit courses that must be taken for a grade, and the GPA must be at least 3.0. These programs are open to anyone with an undergraduate degree in any area of study. The certificate programs are offered to those who do not wish to make the initial commitment to the master’s degree program but wish to update or upgrade their skills. All courses taken may be applied to a MPA if a student decides to pursue the degree.

Certificate Admission Requirements

1. A four-year bachelor’s degree from a recognized college or university
2. A cumulative Grade Point Average (GPA) of at least 3.0 for all undergraduate work (based on A=4.00)

Certificate in Health Administration

The health administration certificate program is designed to prepare people with diverse backgrounds already in the health care industry or those wishing to enter the fast growing and rapidly changing health care profession.

Certificate in Health Administration
Certificate in in Social Entrepreneurship

This certificate program seeks to provide individuals with diverse educational and professional backgrounds, an interdisciplinary core of knowledge necessary to craft, manage, and act within innovative business and nonprofit enterprises that address social needs, create public value, and achieve social change.

**Admission Requirements**

1. Students must hold a baccalaureate degree from an educational institution of recognized standing, as determined by the School of Graduate Studies.
2. Minimum cumulative undergraduate GPA of 2.75 or higher.
3. International students must meet the English language and other admission requirements of the University of North Dakota.
4. Students must submit an admission portfolio containing:
   a. A personal statement addressing how the certificate will help them meet their goals
   b. Official transcripts of all coursework completed
   c. Two (2) letters of reference
   d. A description of relevant work experience

Students should note that the above requirements represent minimum achievement levels necessary to be considered for admission; meeting these requirements does not guarantee admission.

**Certificate Requirements**

Students admitted to the certificate program are required to complete the four three-credit courses (12 credits total) listed below, and are required to maintain a 3.0 GPA in these four courses in order to remain in the program.

In addition, at the conclusion of the certificate program, students will be required to assemble and submit an exit portfolio demonstrating mastery of program content. This portfolio will consist of instructor-designated major writing assignments or projects from each of the four courses listed in the student's program of study.

Select four of the following:

- POLS 532  Public Policy
- POLS 537  Program Evaluation

**Courses**

- **POLS 500. Research Methods. 3 Credits.**
  A statistics course or consent of instructor. This course will focus on various approaches to analyzing political phenomena with the goal of developing students’ ability to think analytically and to distinguish between empirical and normative analysis. The course will then introduce techniques of empirical research including research design, measurement, data gathering, and data analysis. Prerequisite: A statistics course or consent of instructor.

- **POLS 501. Political and Public Policy Analysis. 3 Credits.**
  This course focuses on the use of empirical data both to develop empirical theory and to make policy choices. Topics to be discussed include hypothesis testing, public choice, and policy evaluation. Students will be required to complete an original research project. Prerequisite: POLS 500 or consent of instructor.

- **POLS 502. Seminar: Problems in State and Local Governments. 3 Credits.**
  Directed in-depth inquiry into contemporary structural and policy problems of state and local governments. During the course, each student will prepare a research paper relevant to a current problem suitable for publication and distribution to an identifiable body of public officials and citizens for problem-solving purposes.
POL 503. Government and Business. 3 Credits.
This course is designed to make students aware of the interrelationship of business and government in our society and the importance of this interrelationship in an era of globalization. It introduces public and business administration students to the role of government in advancing, as well as regulating, business. Further it discusses ways that business can and does influence government decisions. It also looks at the ethical responsibilities of business and government in our society. A component of the course involves travel to Washington, D.C. to meet with political officials, e.g., the Congressional delegation; Legislative staff; government regulatory agencies, e.g., the Federal Communications Commission; government advocacy agencies, e.g., Department of Commerce; and national and international business representatives, e.g., Cargill.

POL 508. Seminar: Legislative and Executive Processes. 3 Credits.
Description, analysis, and evaluation of the structures, processes, procedures, and positions of the legislative and executive offices in government.

POL 531. Foundations of Public Administration. 3 Credits.
An extensive overview of Public Administration stressing the basic concepts and trends in the discipline as well as the classic scholars. F.

POL 532. Public Policy. 3 Credits.
A discussion of the initiation, formulation, adoption, implementation, and evaluation of American policy. Various policy areas such as agriculture, education, environment, and welfare will be analyzed.

POL 533. Administrative Ethics in the Public Sector. 3 Credits.
This course examines the challenges faced by public administrators in establishing personal standards of conduct in the administrative environment. Issues such as moral versus political accountability, social justice and whistle blowing are among the topics that will be explored in this course.

POL 535. Public Organizations. 3 Credits.
Description and analysis of bureaucratic organizations with particular emphasis on concepts and characteristics common to public bureaucracies.

POL 536. Public Personnel Administration. 3 Credits.
This course is designed to help managers in all positions of an organization to understand the fundamental nature of public personnel administration, also known as human resource management. Topics to be covered include basic functions such as position classification, wage and salary administration, and performance appraisal. Attention will be given to contemporary issues such as sexual harassment, affirmative action, privacy, and unionization.

POL 537. Program Evaluation. 3 Credits.
This course introduces students to the theories and concepts of program evaluation used to analyze the effectiveness of public programs and enhance decision-making. Students will be introduced to the principal theories and techniques in the field and develop understanding of the benefits and trade-offs of each. In addition, students will develop practical skills through the development of a detailed evaluation design and plan for implementation. S.

POL 538. Public Budgeting and Financial Administration. 3 Credits.
This course will encompass the normative and descriptive budgetary questions in public administration. Orthodoxy, prevailing, and alternative budget theories are presented in generalized and applied settings.

POL 539. Administrative Law. 3 Credits.
Study of the legal dimension of public administration. Study of requirements for rule making and adjudication and of judicial review of administrative decisions.

POL 551. Health Administration and Organization. 3 Credits.
The evolution of health systems and their organizational challenges of administration from human resources to management in times of scarce resources are explored. Specific attention is devoted to Financial Management, Managerial and Fund Accounting, Medicare, Medicaid, Fiscal Intermediaries and Managed Care, and Organizations in Decline.

POL 552. Health Policy. 3 Credits.
This course examines historic and contemporary trends in health care delivery in the United States. Emphasis is placed on addressing health care cost-containment issues; access to health care and, recent efforts to invoke broadly based systemic reforms of the U.S. health care system.

POL 561. Creation and Management of Social Enterprises. 3 Credits.
This course provides an overview of social entrepreneurship and social enterprises, including nonprofit. The course covers methods and techniques of social entrepreneurship, including organizational strategy, design, management; strategic planning, and leadership for social enterprises; legal foundations of social enterprises in the U.S.; and methods of social enterprise program evaluation. F, odd years.

POL 562. Political Advocacy and Social Entrepreneurship. 3 Credits.
This course examines the use of social enterprises, including nonprofit, to achieve political, economic, and social change. Course coverage includes the use of social enterprises as vehicles for social transformation, development and execution of advocacy campaigns for social enterprises, the role of social enterprises within democracies, and the potential for social enterprises to address and overcome problems of collective action. S, even years.

POL 580. Administrative Internship. 1-3 Credits.
Prior approval of instructor required before enrollment. Students are employed on full-time or part-time basis in on-the-job learning situations in federal, state, or local government. Students are required to make an analytical report on some facet of their work. Prerequisite: Instructor consent.

POL 591. Readings in Political Science and Public Administration. 1-3 Credits.
Prior approval of instructor required before enrollment. Selected readings with oral and written reports. Prerequisite: Prior approval of instructor required before enrollment. Repeatable to 3 credits.

POL 593. Problems in Political Science and Public Administration. 1-3 Credits.
Prior approval of instructor required before enrollment. Students study special topics under the direction and supervision of a member of the staff. Prerequisite: Prior approval of instructor required before enrollment. Repeatable to 6 credits.

POL 595. Professional Development in Public Administration. 1 Credit.
Specific issues will vary but topics will focus on the latest issues, trends, and problems facing administrators, especially those in public and not-for-profit agencies. Repeatable to 3 credits. Repeatable to 3 credits.

POL 599. Master of Public Administration Capstone. 1 Credit.
Seminar course intended to assist students in strengthening and further developing essential skills of research and formal presentation (written and oral) for both academic and professional audiences. Students will apply these skills to the completion of their individual Independent Study Project, providing an opportunity to draw upon knowledge and skills from across the program’s curriculum, and to synthesize these elements in the creation of a unique piece of rigorous professional policy analysis. Enrollment is restricted to MPA degree students who have presented a satisfactory Independent Study proposal to their review committee at the conclusion of the previous fall semester. Prerequisite: POLS 997. S.

POL 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

POL 997. Independent Study. 3 Credits.
Seminar course that assists students in the process of developing, researching, composing, and presenting an Independent Study or Policy Paper on a public administration or public policy topic of their choosing, in consultation with one or more faculty advisors. Focused on familiarizing students with the craft of research writing and presentation and enabling them to communicate these findings clearly and effectively to a variety of audiences, orally and in writing. At the conclusion of the course, students will have completed and formally presented a full Policy Paper proposal and will have submitted a plan and timeline for project completion. Prerequisites: POLS 500 and POLS 501 or instructor consent; may be repeated with approval of MPA Program Director or college Director of Graduate Programs if student received a U/P. Repeatable to 3 credits. F.

POL 998. Thesis. 1-4 Credits.

Undergraduate Courses for Graduate Credit

POL 404. Urban Politics and Administration. 3 Credits.
Analysis of the socio-economic context of urban America and its impact on politics, policy, and administration. Prerequisite: POLS 115. S.

Public Health

http://www.med.und.edu/master-of-public-health/

FACULTY: R. Goldsteen (Director), K. Goldsteen, Hand, Hosford, Jonk, Oancea, Selya
**Degree Granted: Master of Public Health (M.P.H.)**

**Mission Statement and Program Goals**

The mission of the University of North Dakota Master of Public Health (MPH) Program is to support population health improvement in North Dakota, the Northern Plains and beyond through education, research, and service that create conditions needed to promote health and well-being, prevent disease and injury, and advance health and social equity among all populations.

Established in 2012, the Master of Public Health (MPH) program offers a 42 credit, accredited degree, which can be earned through full or part-time study. The educational priority of the MPH program is preparing students to respond to the growing demand for public health professionals who can transform data into information for decision-making. The size of health data is growing exponentially, and the skills to ‘mine’ big data are exceptionally valued by public and private health agencies, as well as healthcare provider and payer organizations. Therefore, both MPH specializations – Population Health Analytics and Health Management & Policy – emphasize analytics. Special features include an emphasis on faculty-student research collaboration; application of system dynamics to public health; and opportunities for experiential learning with UND’s nationally recognized wellness initiatives and Grand Forks many public and private organizations working collaboratively to improve health in the community. Residents of states in the Western Interstate Commission for Higher Education (WICHE) Region receive in-state tuition, and the program is designated as STEM. The MPH program was accredited by the Council on Education for Public Health (CEPH) in 2016. Admissions and program information can be found at: [http://www.med.und.edu/master-of-public-health](http://www.med.und.edu/master-of-public-health).

**Master of Public Health (M.P.H.)**

**Admission Requirements**

1. Completion of the online application and payment of the application fee.
2. A baccalaureate degree or equivalent from an accredited college or university (for U.S. degrees, accreditation by one of the six regional accrediting associations: MSA, NASC, NCA, NEASC-CIHE, SACS-CC or WACS-Sr.).
3. An undergraduate and graduate (if applicable) cumulative grade point average (GPA) of at least 3.00.
4. A standardized test.* One of the following tests is required: Graduate Record Examination (GRE) General Test, Medical College Admission Test (MCAT), Graduate Management Admission Test (GMAT), Dental Admission Test (DAT), or Law School Admission Test (LSAT). There is no minimum score required for admission. Scores are used in combination with other indicators to determine eligibility for the MPH program. Standardized test scores must be sent by the testing service directly to UND. The institution code for the UND is 6878.
   a. *A standardized test is not required of applicants who have completed an advanced degree (Master’s degree or higher) in a graduate program at an accredited U.S. or Canadian institution of higher learning.
   b. *A standardized test is not required of applicants who have a minimum of five years of relevant experience in public health that demonstrates ability to engage in graduate level coursework in the field of public health. Please contact the MPH Academic Coordinator for more information.
5. Fluency in written and spoken English. All non-native speakers of English must meet the School of Graduate Studies requirements regarding fluency in written and spoken English. Please refer to the School of Graduate Studies website (http://graduateschool.und.edu/graduate-students/new/admissions-international.cfm#language-proficiency).

Applicants are required to submit the following supporting documentation:

1. A written statement that describes the applicant’s professional goals and motivation for seeking a degree in public health. In addition, applicants should comment on any personal qualities, characteristics, and abilities they believe will enable them to be successful in achieving their career goals.
2. Resume listing work experience, including voluntary, and relevant accomplishments, awards, and honors.
3. Official post-secondary academic transcripts from all institutions attended. Transcripts must be sent directly from the institutions to the UND School of Graduate Studies.
4. Three (3) letters of recommendation from individuals who the applicant feels are most qualified to evaluate their academic potential and leadership potential in public health.

The Admissions Committee may request an in-person or Skype interview with an applicant to assist in the decision process. A background check will be completed on each student before admission is final.

**Program Requirements**

The MPH program requires the successful completion of 42 credits of coursework. The MPH Core curriculum covers all areas required for public health programs accredited by the Council on Education for Public Health (CEPH) including biostatistics, epidemiology, social and behavioral sciences, environmental health, and health management and policy. The MPH program also requires completion of an 18 credit specialization in either Population Health Analytics or Health Management & Policy; a 3 credit Practicum; and a 3 credit Culminating Experience.

**Degree Requirements**

Students seeking the Master of Public Health degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Master of Public Health Program.

**Coursework**

Required MPH Core Coursework (18 credits):

- MPH 531 Biostatistics 1
- MPH 551 Epidemiology
- MPH 520 Environmental Health
- MPH 541 Social and Behavioral Sciences in Public Health
- MPH 510 Health Care Systems
- MPH 504 Leading and Managing Public Health Systems
- MPH 505 Public Health Data Management in SAS
- MPH 506 Public Health Data Management in R

**MPH Practice Experience**

- MPH 594 Practicum, 3 credits

The Practicum is a planned, supervised, and evaluated practice experience. It provides an opportunity to apply basic public health competencies acquired through coursework. The Practicum is designed to meet student goals, specialization criteria, and the needs of the Practicum organization. An approved proposal is required prior to enrollment in this course.

**MPH Culminating Experience**

The MPH core courses must be completed before beginning the Culminating Experience.

- MPH 995 Scholarly Project, 2 credits

The Scholarly Project is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 590. Students complete a project that demonstrates synthesis and application of knowledge acquired through coursework and other public health learning experiences.

- MPH 590 MPH Seminar, 1 credit

The MPH Seminar is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 995. The course addresses current issues in public health. Presentations and discussions focus on dissemination, synthesis, and application of knowledge acquired through coursework and other public health learning experiences.
** MPH Optional Internship Experience **

** MPH 596 Public Health Internship, 6-24 credits **

The Public Health Internship is a professional experience in an approved public health-related agency or organization. An internship is optional for MPH students, and can be paid or unpaid. It does not replace the 42-credit required coursework for the MPH degree but is an additional training experience, which would be undertaken when most or all MPH coursework is complete.

** Specializations **

The two MPH specializations - Health Management & Policy and Population Health Analytics - provide integrative and practical learning experiences that are designed to foster intellectual growth, critical thinking, and essential problem-solving and communication skills. Graduates are prepared to work in many regional, national, and international settings including public health and other government agencies, health care delivery organizations, health plans, non-governmental health organizations, and academic institutions. Each specialization consists of 18 credits.

** Health Management and Policy Specialization **

The specialization in Health Management & Policy provides students with skills needed to manage health care and public health systems effectively and efficiently, analyze and evaluate health policies, and communicate successfully to effect improvements in the health care and public health systems. The curriculum for the specialization is offered in partnership with the College of Business and Public Administration, which adds depth to the faculty expertise and course offerings available to MPH students.

** REQUIRED COURSES = 12 credits **

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>POLS 551</td>
<td>Health Administration and Organization</td>
<td>3</td>
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<tr>
<td>POLS 552</td>
<td>Health Policy</td>
<td>3</td>
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<tr>
<td>MPH 550</td>
<td>Population Health Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>MPH 572</td>
<td>Health Care Budgeting and Finance</td>
<td>3</td>
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** ELECTIVE COURSES = 6 credits **

With advisor approval, other courses may be substituted.

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>POLS 501</td>
<td>Political and Public Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MPH 570</td>
<td>Special Topics in Population Health</td>
<td>1-3</td>
</tr>
<tr>
<td>POLS 561</td>
<td>Creation and Management of Social Enterprises</td>
<td>3</td>
</tr>
<tr>
<td>POLS 562</td>
<td>Political Advocacy and Social Entrepreneurship</td>
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</tr>
<tr>
<td>MPH 574</td>
<td>Foundations of Health Economics</td>
<td>3</td>
</tr>
<tr>
<td>MPH 556</td>
<td>System Dynamics 1</td>
<td>3</td>
</tr>
<tr>
<td>MPH 558</td>
<td>System Dynamics 2</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Geographic Information Systems (GIS)</td>
<td>2</td>
</tr>
<tr>
<td>GEOG 474L</td>
<td>GIS Laboratory (Co-requisite with GEOG 474)</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 574</td>
<td>Advanced Techniques in Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>EFR 510</td>
<td>Qualitative Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 537</td>
<td>Program Evaluation</td>
<td>3</td>
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</tbody>
</table>

** Population Health Analytics Specialization **

The specialization in Population Health Analytics provides students with skills needed to produce convincing and scientifically sound information about population health, evaluate the effectiveness of population health interventions, and provide the basis for improving health policies and programs. The course of study includes training in research methods, biostatistics, informatics, and communication of scientific results. Students learn how to design outcomes and comparative effectiveness studies, collect and analyze population health data, and communicate results.

** REQUIRED COURSES = 12 credits **

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MPH 532</td>
<td>Biostatistics 2</td>
<td>3</td>
</tr>
<tr>
<td>MPH 533</td>
<td>Advanced Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>MPH 550</td>
<td>Population Health Research Methods</td>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MPH 556</td>
<td>System Dynamics 1</td>
<td>3</td>
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</table>

** ELECTIVE COURSES = 6 credits **

With advisor approval, other courses may be substituted.

<table>
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<tr>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MPH 534</td>
<td>Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>MPH 535</td>
<td>Health Care Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>MPH 538</td>
<td>Introduction to Structural Equation Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MPH 558</td>
<td>System Dynamics 2</td>
<td>3</td>
</tr>
<tr>
<td>MPH 570</td>
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<td>3</td>
</tr>
<tr>
<td>POLS 537</td>
<td>Program Evaluation</td>
<td>3</td>
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</table>

** Graduate Certificate in Public Health **

The Graduate Certificate in Public Health is offered as part of the MPH Program. It is designed for people who wish to obtain formal training in public health, but do not want to earn the MPH degree. These include people currently working in the public health and health care fields, as well as others. The Graduate Certificate in Public Health requires completion of 15 credits.

Students may earn the certificate in one of two areas of emphasis: General Public Health or Population Health Analytics. Each area of emphasis requires completion of 15 credits, as outlined below. Applicants must meet all admissions requirements of the MPH Program except completion of a standardized test. All credits from the certificate program can be transferred into the MPH Program, if the student wishes. In addition, some students who complete the Graduate Certificate in Public Health will be eligible to sit for the Certified in Public Health (CPH) examination (see CPH eligibility requirements for more information).

** Area of Emphasis: General Public Health **

The following courses are required for the General Public Health Emphasis of the Graduate Certificate in Public Health.

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MPH 510</td>
<td>Health Care Systems</td>
<td>3</td>
</tr>
<tr>
<td>MPH 520</td>
<td>Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>MPH 531</td>
<td>Biostatistics 1</td>
<td>3</td>
</tr>
<tr>
<td>MPH 541</td>
<td>Social and Behavioral Sciences in Public Health</td>
<td>3</td>
</tr>
<tr>
<td>MPH 551</td>
<td>Epidemiology</td>
<td>3</td>
</tr>
</tbody>
</table>

** Area of Emphasis: Population Health Analytics **

The following courses are required for the Population Health Analytics Emphasis of the Graduate Certificate in Public Health.

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>MPH 531</td>
<td>Biostatistics 1</td>
<td>3</td>
</tr>
<tr>
<td>MPH 550</td>
<td>Population Health Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>MPH 551</td>
<td>Epidemiology</td>
<td>3</td>
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</table>

An additional six credits of electives must be completed to satisfy requirements for the Population Health Analytics Area of Emphasis. The following list includes approved electives. Another course may be substituted with advisor approval.

<table>
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</tr>
<tr>
<td>MPH 556</td>
<td>System Dynamics 1</td>
<td>3</td>
</tr>
</tbody>
</table>
Courses

**MPH 504. Leading and Managing Public Health Systems. 2-3 Credits.**
This course introduces students to public health systems and their unique role in promoting health and preventing disease in populations, especially vulnerable populations. Organization, financing, and system performance are discussed. Differences between rural and urban public health systems, as well as international differences, are studied. The course covers professionalism, ethics, leadership, and management related to public health. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 505. Public Health Data Management in SAS. 1 Credit.**
This course introduces students to the basics of data management using the statistical software SAS. The course emphasizes management and manipulation of large data sets using the active learning approach. Students need to bring their laptop computers to class, as well as a flash drive on which to store SAS programs and data sets. Data for exemplification will be chosen from the large array of online and publicly available health-related data sets. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 506. Public Health Data Management in R. 1 Credit.**
This course introduces students to the basics of data management using the statistical software R. The course emphasizes management and manipulation of large data sets using the active learning approach. Students need to bring their laptop computers to class, as well as a flash drive on which to store R programs and data sets. Data for exemplification will be chosen from the large array of online and publicly available health-related data sets. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 510. Health Care Systems. 2 Credits.**
This course introduces students to health care delivery systems, which provide diagnosis and treatment of health problems in societies. Topics include the organization, financing, and performance of health care delivery systems. Differences between rural and urban health systems, as well as international differences, are studied. Ethical issues related to the delivery of health care are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 520. Environmental Health. 3 Credits.**
This course introduces the key concepts, principles, and applications of the primary science disciplines that underpin environmental health. It provides an overview of the major pollutants including their detection, impact on health, and principles of remediation. Ethical issues related to environmental health are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 531. Biostatistics 1. 3 Credits.**
This MPH Core course introduces the selection, use, and interpretation of basic statistical tests and concepts that may be used in addressing, analyzing, and solving problems in public health and health care research. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 532. Biostatistics 2. 3 Credits.**
This course continues the introduction to biostatistics begun in MPH 531 on the selection, use, and interpretation of basic statistical tests and concepts that may be used in addressing, analyzing, and solving problems in public health and health care research. Topics include multiple linear regression, analysis of variance as a special case of multiple linear regression, and an introduction to logistic regression. Prerequisite: MPH 531, F,S,SS.

**MPH 533. Advanced Biostatistics. 3 Credits.**
This course develops advanced skills in biostatistics, with an emphasis on applied research in public health and medicine. Students learn how to derive quantitative answers to an applied research question by using multivariate statistical modeling. The course covers advanced topics in analysis of variance, linear and logistic regression, survival analysis, and generalized linear models. Prerequisites: MPH 532 and MPH 550. F,S,SS.

**MPH 534. Bioinformatics. 3 Credits.**
This course introduces bioinformatics techniques and tools in analysis of various types of high-throughput biomedical data, such as microarray, genotyping and next-generation sequencing data. Students will learn the essential principles of conducting genomics research, and will gain hands-on experience of bioinformatics research using real research data. The advanced bioinformatics methods, such as data mining, graph theory, and high performance computing, are discussed. Prerequisite: Permission of Instructor. On demand.

**MPH 535. Health Care Data Mining. 3 Credits.**
This course covers data mining concepts and methods that are important for health informatics. Basic topics in clustering and classification, such as hierarchical clustering, logistic discrimination, decision tree, variable selection, Bayesian decision model, and others are introduced. Students learn the techniques of data mining from an applications perspective. Students will have access to large healthcare datasets in a local server computer and have hands-on experience using data mining software. Prerequisite: Permission of Instructor. On demand.

**MPH 538. Introduction to Structural Equation Analysis. 3 Credits.**
This course provides (a) introductory coverage of confirmatory latent variable techniques, including confirmatory factor analysis and structural equation methods; (b) in-depth presentation of special issues related to the application of these techniques in social science-based research; and (c) a comparison of these techniques with traditional analytical approaches. Prerequisite: Graduate statistics course with knowledge of linear multiple regression. On demand.

**MPH 541. Social and Behavioral Sciences in Public Health. 3 Credits.**
This course introduces social and behavioral sciences theories and methods that are applied to public health problems. It covers: (1) description of social and behavioral determinants of health and health inequalities; (2) individual- and social/interpersonal-level theories of health behavior and change methods; (3) theories and methods for improving the health of communities/populations; (4) public health evaluation strategies; and (5) public health policy and advocacy. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 544. Leadership of Health Care Organizations. 3 Credits.**
Leaders of health care organizations can promote or inhibit optimum performance and desirable change. Students learn how to analyze and assess leadership qualities through application of leadership theories, methods, and techniques. Topics include leadership versus management, leading organizational change, dealing with workforce and organizational challenges, and related subjects. Prerequisite: MPH major or instructor consent. On demand.

**MPH 550. Population Health Research Methods. 3 Credits.**
This course provides an overview of the research process including formulation of a research problem, selection of a research design, construction of an instrument for data collection, selection of a sample, collection and processing of data, and writing a research report. Topics include how to identify a research question; reasons and procedures for reviewing the literature; observational and intervention research designs; and commonly used measures in public health-related research. Prerequisites: MPH 531. On demand.

**MPH 551. Epidemiology. 3 Credits.**
This course introduces the basic epidemiologic concepts used to study health and disease in populations including measurement, study design, and related statistical tests. Observational and experimental epidemiologic studies are described and their advantages and disadvantages compared. The course provides an overview of the major causes of morbidity and mortality in populations. Ethical issues related to epidemiology are discussed. Prerequisite: Enrollment in MPH degree program or certificate. On demand.

**MPH 554. Continuous Quality Improvement for Health Care Organizations. 3 Credits.**
This course provides a detailed view of quality improvement techniques, methods, and evaluation in health care organizations. The knowledge gained from these quality improvement methods enable students to identify, address, analyze, and solve organizational quality shortcomings with the ultimate goal of improving healthcare quality. Topics include quality assessment, quality assurance, total quality management, continuous quality improvement, health care reform related to quality improvement, patient safety, and quality health outcomes. Prerequisites: MPH 510 and MPH major or instructor consent. On demand.
MPH 556. System Dynamics 1. 3 Credits.
This course provides an introduction to the System Dynamics field of study which is a computer-aided approach to improving system performance through policy analysis and design. The knowledge and critical thinking skills gained from this course will enable students to work either independently or on interdisciplinary teams to effectively deal with problems arising from dynamically complex systems. Topics include: perspective and process; tools for systems thinking; the dynamics of growth; tools for modeling dynamic systems; instability and oscillation; model testing; and challenges for the future. This course is open to UND graduate students in all disciplines. On demand.

MPH 558. System Dynamics 2. 3 Credits.
This course builds on MPH 556: System Dynamics 1. This course will enable students to effectively plan and manage System Dynamics projects by providing knowledge and skill relating to advanced modeling techniques, software capabilities, and client engagement processes. Topics include: model building, documentation and presentation best practices; use of historical data; model calibration and testing techniques; advanced software features; group model building; and implementation challenges. This course is open to UND graduate students in all disciplines. Prerequisite: MPH 556. On demand.

MPH 570. Special Topics in Population Health. 1-3 Credits.
This course explores special topics in the field of population health. Topics vary with faculty expertise and issues current in the field. The course may be repeated for credit if the topics are different. Prerequisite: Approval of Faculty Advisor. Repeatable to 6 credits. F,S,SS.

MPH 572. Health Care Budgeting and Finance. 3 Credits.
This course focuses on learning and applying financial and managerial accounting principles and techniques to health services organizations. The subject matter is designed to provide a working knowledge of accounting, finance, and budget terminology. Components of the class include the evolution of healthcare finance and reimbursement, revenue and expense classifications, financial reporting, budgeting, financial analysis, financing of public health agencies, and the current and anticipated financial impact of healthcare reform on the healthcare industry and health services organizations. Prerequisite: MPH major or instructor consent. On demand.

MPH 574. Foundations of Health Economics. 3 Credits.
This course serves as an introduction to the role of economics in health care and health policy. The microeconomic principles of supply and demand are introduced, and topics such as the demand for health, the derived demand for medical care, and the demand for health insurance are covered. On the supply side, the course examines the supply of medical care by physicians and hospitals, medical technology, and the role of managed care organizations. Implications of adverse selection, moral hazard, externalities, and asymmetric information are addressed. Cost-benefit and cost effectiveness analyses are also introduced. The course examines the role of government in health care and health care reform including the implications of expanding insurance coverage under the Affordable Care Act. The effectiveness and efficiency of various health policies are also addressed, including government forms of insurance coverage such as Medicare, Medicaid, and the Department of Veterans' Affairs, price regulation of hospitals, provider payment reform, medical malpractice, uncompensated care, and health care workforce issues. Prerequisite: College Algebra and one of the following: Basic Statistics or Biostatistics, Introductory Micro- or Macro- Economics; or Consent of Instructor. On demand.

MPH 590. MPH Seminar. 1 Credit.
The MPH Seminar is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 995. The course addresses current issues in public health. Presentations and discussions focus on dissemination, synthesis, and application of knowledge acquired through coursework and other public health learning experiences. Prerequisite: Complete all MPH core courses. Corequisite: MPH 995. F,S,SS.

MPH 594. Practicum. 1-3 Credits.
The Practicum is a planned, supervised, and evaluated practice experience. It provides an opportunity to apply basic public health competencies acquired through coursework. The Practicum is designed to meet student goals, specialization criteria, and the needs of the Practicum organization. An approved proposal is required prior to enrollment in this course. Prerequisites: Enrollment in MPH degree program, completion of core courses and consent of instructor. Repeatable to 3 credits. F,S,SS.

MPH 596. Public Health Internship. 2-24 Credits.
The internship is a professional experience in an approved public health-related agency or organization. An internship is optional for MPH students, and can be paid or unpaid. It does not replace the 42-credit required coursework for the MPH degree but is an additional training experience, which would be undertaken when most or all MPH coursework is complete. Prerequisite: Approval of MPH program director. Repeatable to 24 credits. S/U grading. On demand.

MPH 995. Scholarly Project. 2 Credits.
The Scholarly Project is one component of the MPH Culminating Experience, and enrollment is concurrent with MPH 590. Students complete a project that demonstrates synthesis and application of knowledge acquired through coursework and other public health learning experiences. Prerequisite: Complete all MPH core courses or instructor permission. Corequisite: MPH 590. F,S,SS.

MPH 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

Social Work
http://www.und.edu/dept/socialwo/

FACULTY: Barkdull (Chair), Flanagan, Hsieh, Jayasundara, Kitko, Lindgren, Nedegaard (MSW Program Director), Quinn, Reeves, Sage M., Sage T., Schneweis (Distance MSW Program Coordinator) and Weber

Degree Granted: Master of Social Work (M.S.W.)
The Department of Social Work offers the following degrees: a Bachelor of Science in Social Work and a Master of Social Work. The mission of the Department of Social Work at the University of North Dakota is to prepare entry-level and advanced generalist Social Workers within the region to advance practice knowledge, values and skills consistent with the highest ideals of the profession by:

- empowering vulnerable, oppressed, disadvantaged, and rural populations;
- maximizing opportunities for every individual to realize his or her highest potential; and
- promoting respect, awareness, and appreciation for culture and social justice at every level of society.

Graduates of the MSW program will:

- Engage in advanced-level social work practice that is informed by the best available evidence.
- Understand the impacts of culture, oppression, and human diversity in a multi-cultural society.
- Apply social work ethical principles to guide their professional practice.
- Advance social and economic well-being and deliver effective social work services through policy practice.
- Apply knowledge of human behavior and the social environment to work with individuals, groups, families, organizations, and communities.
- Identify themselves as professional social workers and act accordingly.

Social Work courses were first offered at the University of North Dakota in 1905; the Social Work program was formally established in 1939. The Council on Social Work Education (2002) states, "The purposes of social work education are to prepare competent and effective professionals, to develop social work knowledge, and to provide leadership in the development of service delivery systems. Social work education is grounded in the profession's history, purposes, and philosophy and is based on a body of knowledge, values, and skills. Social work education enables students to integrate the knowledge, values, and skills of the social work profession for competent practice."
the part-time Distance Program. The Campus Program can be completed in three semesters, and the Distance Program can be completed in two years for students with a BSW, or as few as three years for students without a BSW.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

**Master of Social Work (M.S.W.)**

The MSW program has an Advanced Generalist Concentration, preparing students for leadership roles in service, administration, and policy-making positions. Graduates master competencies that prepare them for effective practice with individuals, families, groups, organizations, and communities. Graduates work in a diverse array of human service settings, including mental health, family services, child welfare, schools, criminal justice, gerontology, and health care organizations and agencies.

The Advanced Generalist Concentration equips students for effective practice in highly under-served areas, including rural and reservation communities. These settings demand that students be able to synthesize and apply interdisciplinary knowledge and skills to address needs in complex, multi-system service environments.

**Mission Statement**

The University of North Dakota’s Master of Social Work Program provides broad access to quality graduate education that prepares versatile advanced generalist practitioners with the necessary knowledge, values, and skills to enhance human well-being, to meet basic human needs, and to serve as leaders in their communities in North Dakota, the region, and beyond.

**Program Goals**

To prepare advanced generalist social work practitioners who:

- Have a strong identification with the social work profession, are committed to its highest ethical ideals, and inspire others to do the same.
- Continually strive to increase their cultural competence and understand and respect the inherent value of human diversity.
- Understand the forms and mechanisms of oppression and discrimination and advocate for social and economic justice.
- Synthesize and effectively apply a broad range of interdisciplinary and multidisciplinary knowledge and skills across practice levels.
- Have a passion for critical inquiry and a commitment to lifelong learning.
- Embrace their roles as change agents and leaders.

The MSW Concentration builds on a generalist foundation curriculum (typically attained from a BSW program) to prepare advanced generalist practitioners who assess, intervene, and evaluate to promote human and social well-being, while advancing practice and the broader goals of the Social Work profession. Advanced practitioners can tailor actions to changing circumstances, and continually refine their own practice through experience and self-improvement.

All MSW students must complete both generalist Foundation and Advanced Generalist Concentration social work courses. Foundation courses are not offered through the Campus Program; instead, students who have a bachelor’s degree in a related field may apply to the Second Degree Program. Upon successful completion of the Second Degree Program, students are eligible to apply to the MSW Concentration Program. Advanced Generalist Concentration courses may be completed through the Campus Program (full-time or part-time), or the part-time Distance Program. The Campus Program may be completed in as few as three semesters, and the Distance Program may be completed in two years for students with a BSW, or in as few as three years for students without a BSW.

**Master of Social Work (M.S.W.)**

**Admission Requirements for the M.S.W. Foundation Program**

(For students without a B.S.W.)

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog.

Applicants for the Foundation courses (offered only through the part-time Distance Program for students without a BSW) must meet the following standards:

1. Satisfactory completion of a bachelor’s degree from an accredited institution.
2. At least 30 credit hours of liberal arts courses in such fields as biology, music, languages, anthropology, economics, political science, history, literature, sociology, psychology, and philosophy.
3. A grade of C or higher in a statistics course prior to entering the Advanced Generalist Concentration portion of the MSW program.
4. Willingness to abide by the National Association of Social Worker’s Code of Ethics and the University of North Dakota Code of Student Life.
5. An undergraduate GPA of 3.00 overall or a GPA of 3.00 in the last two years of the undergraduate program.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Admission Requirements for the M.S.W. Concentration Program**

(For students with a B.S.W.)

Applicants for the Concentration courses must meet the following standards:

1. BSW from a CSWE accredited program.
2. An undergraduate GPA of 3.00 overall or a GPA of 3.00 in the last two years of the undergraduate program.
3. A grade of C or higher in a statistics course.
4. Willingness to abide by the National Association of Social Worker’s Code of Ethics and the University of North Dakota Code of Student Conduct.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

**Admission Schedule**

- **Campus Program**: Annual application deadline is January 15. Classes begin the following Fall Semester (August).
- **Distance MSW Foundation Courses**: Applicants without a BSW must apply for Foundation courses. Annual application deadline is June 15. Classes begin the following Spring Semester (January).
- **Distance Program Concentration Courses**: Applicants with a BSW are considered “Advanced Standing” applicants and apply for Concentration courses. Annual application deadline is November 15. Classes begin the following Summer Semester (May).

The Department of Social Work will continue to accept applications after the deadline if the cohort is not full.

**Degree Requirements**

(For students without a B.S.W.)

Students seeking the Master degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Social Work Department. Credit is not granted for life or work experience.

**Degree Requirements for Students Completing Both Foundation and Concentration Courses:**

1. Successful completion of 60 credit hours of courses approved by the social work faculty with at least a 3.00 grade point average. The number of electives required is dependent on whether a student selects the independent study or the thesis option.
2. Satisfactory completion of Foundation courses (24 credit hours).

**Foundation Courses**

- SWK 501 Human Behavior in the Social Environment I 2
- SWK 502 Human Behavior in the Social Environment II 2
- SWK 503 Generalist Practice with Individuals and Families 2
Degree Requirements 

(For Students with a B.S.W.)

1. Successful completion of 36 credit hours of courses approved by the social work faculty with at least a 3.00 grade point average. Students who complete SWK 997 Independent Study must complete 5 elective credit hours; students who choose to complete SWK 998 Thesis must take 3 elective credit hours. 

2. Satisfactory completion of the Advanced Generalist Concentration core courses listed below:

   **Concentration Courses**

   SWK 504 Generalist Practice with Treatment and Task Groups 2 
   SWK 505 Generalist Practice with Communities and Organizations 2 
   SWK 506 Social Policy 2 
   SWK 507 Generalist Research Methods and Analysis 2 
   SWK 515 Generalist Practice Field Education I 3 
   SWK 516 Generalist Practice Field Education Seminar I 1 
   SWK 517 Generalist Practice Field Education Seminar II 1 
   SWK 518 Generalist Practice Field Education Seminar II 1 

   Total Credits 24

3. Satisfactory completion of the Advanced Generalist Concentration courses (36 credit hours).

4. Completion of the research capstone, SWK 997 Independent Study (2 credits), or SWK 998 Thesis (4 credits).

5. Successful completion of comprehensive exam requirements.

6. Completion of at least 52 semester credits at UND. A maximum of 8 credits will be allowed for transfer.

7. The development of a program of study in the semester in which the full-time student first enrolls in Concentration courses, or the second semester in which the part-time student enrolls in Concentration courses.

**Non-Thesis Option:**

1. Full-time students select a faculty adviser by the end of the first semester of enrollment in Concentration courses. Part-time students select a Faculty Advisory Committee during the second semester of enrollment in Concentration courses.

2. A proposal must be submitted no later than the semester prior to the student’s final semester.

**Courses**

SWK 501. Human Behavior in the Social Environment I. 2 Credits.

Generalist Human Behavior in the Social Environment I (HBSE I) provides students with foundational knowledge relevant to human life span development, and an introduction to social work systems perspectives. Students critique and apply various frameworks to case scenarios that exemplify client differences in biological, psychological, social, spiritual, and cultural domains. Prerequisite: Admission to the MSW program. Prerequisite or Corequisite: SWK 507.

SWK 502. Human Behavior in the Social Environment II. 2 Credits.

In Human Behavior and the Social Environment II (HBSE II), students acquire foundational knowledge of social work theories relevant to group, community, and organizational practice. The course emphasizes applications of theory to practice for purposes of enhancing economic, social, and environmental well-being. Students learn to recognize diversity through multiple factors, and deepen understanding of how these differences can influence poverty and marginalization, as well as power and privilege. Prerequisite: Admission to the MSW program. Prerequisite or Corequisite: SWK 507.

SWK 503. Generalist Practice with Individuals and Families. 2 Credits.

Generalist Practice with Individuals and Families provides foundational knowledge, values, and skill development for generalist social work practice with individuals and families using a strengths-based perspective. Students develop skills in relationship-building, assuming collaborative partnerships, describing problems, accessing resources, developing intervention plans, and evaluating progress with individuals and families. Prerequisite: Admission to the MSW program. Prerequisite or Corequisite: SWK 501.

SWK 504. Generalist Practice with Treatment and Task Groups. 2 Credits.

In Generalist Practice with Treatment and Task Groups, students develop foundational knowledge, values, and skills necessary for assessing, intervening, and evaluating with the context of group practice. The course emphasizes the identification, analysis, and implementation of evidence-based interventions. Students also learn to apply a social justice framework to group practice. Prerequisites or Corequisites: SWK 501 and SWK 502.

SWK 505. Generalist Practice with Communities and Organizations. 2 Credits.

Generalist Practice with Communities and Organizations acquaints students with the historical roots of social work in community and organizational practice, and with the changing landscape of organizations within the human service sector. Students develop skills relevant to engaging, assessing, intervening, and evaluating community and organizational practice and develop strategies for macro-practice with diverse populations. Prerequisite or Corequisite: SWK 502.

SWK 506. Social Policy. 2 Credits.

Provides a basic understanding of the history and current patterns of social welfare services in the United States. Students apply a policy analysis framework to identify key issues, understand policy development, and assess the role of social policies and political processes on the well-being of individuals, families, and communities. Students also learn to identify opportunities for actively engaging in the policy arena. Prerequisite: Admission to the MSW program.
SWK 507. Generalist Research Methods and Analysis. 2 Credits.
This introductory course provides students with foundational knowledge of research methods and analysis, and prepares them for the development of advanced research skills. Students gain knowledge of the methods of scientific inquiry and how to construct and utilize evidence-informed research for practice. The course emphasizes ethical approaches to research and the effective communication of empirically-based knowledge. Prerequisite: Admission to the MSW program.

SWK 515. Generalist Practice Field Education I. 3 Credits.
Generalist field internship placement in a human service organization. Students apply foundation coursework, emphasizing core competencies and demonstration of practice behaviors. Prerequisite: Admission to field program. Corequisite: SWK 516. S/U grading. F.

SWK 516. Generalist Practice Field Education Seminar I. 1 Credit.
Integration of foundation coursework with field internship placement in a human service organization. Continued development of identification with the Social Work profession is emphasized, as is application of Social Work ethics and values. Corequisite: SWK 515. F.

SWK 517. Generalist Practice Field Education II. 5 Credits.

SWK 518. Generalist Practice Field Education Seminar II. 1 Credit.
Integration of foundation coursework with field internship placement in a human service organization. Continued development of identification with the Social Work profession is emphasized, as is application of Social Work ethics and values. Corequisite: SWK 517. S.

SWK 527. Advanced Generalist Human Behavior and the Social Environment I. 2 Credits.
In Advanced Generalist Human Behavior and the Social Environment I (AG HBSE I), students learn to synthesize and differentially apply relevant conceptual frameworks to guide advanced generalist practice with individuals and families. This course builds upon developmental theories and the social work ecological and systems perspectives. Prerequisite: Admission to the Advanced Generalist Concentration.

SWK 528. Advanced Generalist Human Behavior and the Social Environment II. 2 Credits.
Advanced Generalist Human Behavior and the Social Environment II (AG HBSE II) considers practice theories in relation to social and economic justice. Complexity theory builds upon traditional social systems theory to provide and advanced framework for analyzing practices within the social, economic, and natural environments. Prerequisite: Admission to the Advanced Generalist Concentration.

SWK 529. Advanced Generalist Research Methods and Analysis. 2 Credits.
Advanced Generalist Research Methods and Analysis prepares students to build on foundation research knowledge to further refine and advance the quality of social work practice and that of the larger social work profession. The course emphasizes program as well as practice evaluation. Students use research methods to generate surveys; learn to choose, utilize, and interpret reliable and valid measurement instruments; and apply both qualitative and statistical analysis. Prerequisite: Admission to the Advanced Generalist Concentration.

SWK 530. Advanced Generalist Practice with Individuals. 2 Credits.
Advanced Generalist Practice with Individuals helps students refine and deepen their conceptual and technical knowledge of social work practice with individuals. The course equips students with advanced generalist skills to guide engagement, assessment, intervention, and evaluation with individual clients. Course assignments promote ethical and evidence-based practice relevant to diverse populations. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 527, and SWK 529.

SWK 533. Advanced Generalist Practice with Families. 2 Credits.
Advanced Generalist Practice with Families teaches students advanced generalist skills in working with families to engage, assess, intervene and evaluate client systems. This class builds upon family therapy theories and their practical applications. Activities and assignments build skills necessary to work with families in therapeutic settings. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 527, and SWK 529.

SWK 534. Advanced Generalist Practice with Treatment Groups. 2 Credits.
Advanced Generalist Practice with Treatment Groups uses an interpersonal perspective as a theoretical foundation for understanding group dynamics. Students build upon foundational knowledge and skills, and develop and demonstrate advanced techniques for engaging individuals in the group process, assessing appropriateness for group membership, developing interventions, and evaluating the treatment group process. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 527, SWK 528, and SWK 529.

SWK 535. Advanced Generalist Practice with Communities. 2 Credits.
Advanced Generalist Practice with Communities equips students with theoretical frameworks and models for community and policy practice, and prepares students to be effective change agents and leaders in community contexts. Students develop a deeper social and economic development orientation, and gain a greater understanding of the changing socio-political contexts of practice, including globalization and the human rights movement. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 528 and SWK 529.

SWK 536. Advanced Generalist Practice with Organizations. 2 Credits.
Advanced Generalist Practice with Organizations develops practice behaviors related to organizational leadership, managing various organizational systems, and developing an integrated practice approach for the purpose of promoting effective service delivery. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 528 and SWK 529.

SWK 537. Advanced Generalist Tools for Policy. 1 Credit.
Advanced Generalist Tools for Policy emphasizes the development of skills for effective policy action to promote social, economic, political, and environmental well-being. Prerequisites or Corequisites: Admission to the Advanced Generalist Concentration, SWK 528, SWK 529, and SWK 535.

SWK 560. Topics Of Social Work Practice. 1-3 Credits.
Repeatable to 9 credits.

SWK 580. Advanced Generalist Practice Field Education I. 5 Credits.
Advanced generalist field internship placement in a human service organization. Students apply concentration coursework, emphasizing core competencies and demonstration of practice behaviors. Prerequisite: Admission to field program. Corequisite: SWK 581. S/U grading. F,S,SS.

SWK 581. Advanced Generalist Practice Field Education Seminar I. 1 Credit.
Integration of concentration coursework with field internship placement in a human service organization. Understanding the role of the MSW-level Social Worker is emphasized, as is advanced application of Social Work ethics and values. Corequisite: SWK 580. F,S,SS.

SWK 582. Advanced Generalist Practice Field Education II. 5 Credits.
Advanced generalist field internship placement in a human service organization. Students apply concentration coursework emphasizing core competencies and demonstration of practice behaviors. Corequisite: SWK 583. Prerequisite or Corequisite: SWK 580. S/U grading. F,S,SS.

SWK 583. Advanced Generalist Practice Field Education Seminar II. 1 Credit.
Integration of concentration coursework with field internship placement in a human service organization. Understanding the role of the MSW-level Social Worker is emphasized, as is advanced application of Social Work ethics and values. Corequisite: SWK 582. F,S,SS.

SWK 593. Individual Study. 1-2 Credits.
Variable topics in social work related areas carried out individually or in small groups under the supervision of the instructor. Repeatable for a maximum of 4 credits. Prerequisite: Consent of instructor. Repeatable to 4 credits.

SWK 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

SWK 997. Independent Study. 2 Credits.

SWK 998. Thesis. 2-4 Credits.
Total of 4 credits required in thesis option. Repeatable to 4 credits.

Sociology
http://www.und.edu/dept/soc/
Degree Granted: Master of Arts (M.A.)

The Master of Arts degree in sociology is a 30-credit hour program that is divided into four tracks: General, College Teaching, Criminal Justice, and Health and Human Services. Each track requires a thesis and a "B" average or better in coursework. The core courses include sociological inquiry, social theory, research design, statistical methods, and seminars in social problems and policy. The four separate tracks also require an additional 7 to 9 credits in topic specific coursework.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Arts (M.A.)

Mission Statement

The mission of the sociology graduate program is to prepare students for acceptance into doctoral programs, university teaching careers, or professional careers that allow them to apply their advanced sociological training. Students will develop sophisticated theoretical, methodological, and analytical skills with which to examine sociological research questions. All courses in the curriculum focus on building these skills to a level in which the student is able to independently engage in research informed by a sociological perspective and to solve complex problems in the professional world.

Program Goals

Goal 1: How is sociology distinctive as a discipline? Students should be able to:

Objective a: Demonstrate an ability to understand empirical sociological studies, including what makes a given study sociological in nature.

Objective b: Create a sociological research question, including an argument for how it is sociologically informed.

Goal 2: What do sociologists know? Students should be able to:

Objective a: Utilize existing sociological literature to build a case for a specific research question.

Objective b: Synthesize existing sociological literature to frame the development of hypotheses.

Goal 3: How is sociological knowledge produced? Students should be able to:

Objective a: Use theoretical concepts to inform a research question.

Objective b: Develop and implement sociological methods to answer a research question.

Objective c: Analyze data statistically at the multivariate level.

Goal 4: How is sociological knowledge communicated? Students should be able to:

Objective a: Use discipline-specific conventions to communicate sociological research in writing.

Objective b: Create and deliver oral presentations of sociological research using discipline-specific conventions.

Master of Arts (M.A.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor’s degree from a recognized college or university.
2. A minimum of twenty semester hours of undergraduate sociology or related fields with an overall grade point average of 3.00 (A=4.0), a GPA of at least 3.25 for the last two years of undergraduate study; and 3.25 GPA in their major.
3. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
4. Approved status presupposes some undergraduate training in methods of social research, statistics, and sociological theory with a minimum grade of B in each.

Degree Requirements

Thesis Option:

1. A minimum of 30 semester credits in a sociology track, including the credits required for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
4. Program work must include 7-9 credits in courses for a chosen sociology track, including approved courses from other designated university departments.
5. Program must include a systematic treatment of the field of sociological theory plus sufficient training in research methods and statistical techniques to assure understanding and competence in their use.
6. Required Courses: (Grade of “B” or better is required for all of the following)
   SOC 500 Professional Seminar 1
   SOC 510 Sociological Inquiry 3
   SOC 511 Contemporary Sociological Theory 3
   SOC 520 Advanced Research Design 3
   SOC 521 Advanced Statistical Methods 3
   Select two of the following: 6
   SOC 528 Seminar in Research Methods
   SOC 538 Seminar in Social Problems
   SOC 539 Seminar in Sociology (repeatable when topics vary)
   SOC 540 Seminar in Social Policy
   SOC 569 Introduction to Social Entrepreneurship (requires admission into Social Entrepreneurship)

Selected Track

7-9

General Track
7 to 9 credits of electives as determined by the student and their advisor

College Teaching Track
7 to 9 credits of electives including SOC 592, 594, 599 and/or courses from the following choices:
   HE 505 The College Student
   HE 507 Collegiate Environments
   T&L 539 College Teaching
   T&L 544 Assessment in Higher Education
   T&L 545 Adult Learners
   T&L 548 The Professoriate

Criminal Justice Track
7 to 9 credits of electives including SOC 592, 594, 599 and/or courses from the following choices:
   CJ 510 Historical Perspectives in Criminology
   CJ 511 Contemporary Perspectives in Criminology
   CJ 515 Human Nature and Crime
   CJ 516 Theories of Punishment
   CJ 535 Seminar in Juvenile Justice
   CJ 540 Seminar in Criminal Justice Policy
   CJ 545 Seminar in Rural Justice Issues
   CJ 555 Seminar in Tribal Justice Systems
   CJ 565 Victimization

For CJ courses, the prerequisite requiring admission to the Criminal Justice Ph.D. program will be waived for Sociology MA students pursuing the Criminal Justice track.

Health and Human Services Track
Courses

**SOC 500. Professional Seminar. 1 Credit.**
The course is intended as an introduction to graduate studies, the university and to the opportunities in the discipline of Sociology. Prerequisite: Admission to the graduate program in Sociology. S/U grading.

**SOC 510. Sociological Inquiry. 3 Credits.**
This course focuses on the processes by which sociologists perceive, understand, and study social phenomena.

**SOC 511. Contemporary Sociological Theory. 3 Credits.**
An examination and comparison of the major current sociological theories.

**SOC 512. Advanced Sociological Theory. 3 Credits.**
Advanced overview of topics in the field of sociological theory. Prerequisite: SOC 511 or consent of instructor. On demand.

**SOC 520. Advanced Research Design. 3 Credits.**
This course emphasizes the development of research design skills including survey research. Prerequisites: SOC 323 and SOC 326. S.

**SOC 521. Advanced Statistical Methods. 3 Credits.**
An in-depth examination and application of the following topics as they relate to survey research in sociology: data processing; quantification and analysis of data; analytical statistical design; and procedures. The student will apply the various analytical statistical methods to available data. Prerequisites: SOC 323, SOC 326, and SOC 520. F.

**SOC 528. Seminar in Research Methods. 3 Credits.**
An examination of special topics in the field of research methods. Prerequisite: SOC 323. Repeatable to 6 credits. On demand.

**SOC 537. Graduate Cooperative Education. 3 Credits.**
A practical work experience with an employer closely associated with the student's cognate area. Prerequisite: Program of study committee and Director of Graduate Studies approval is required. S/U grading.

**SOC 538. Seminar in Social Problems. 3 Credits.**
An examination of special topics with a focus on social problems and potential solutions. Prerequisite: Admission to the graduate school or consent of instructor. F, odd years.

**SOC 539. Seminar in Sociology. 3 Credits.**
An in-depth examination of a particular sub-field in Sociology. Prerequisite: Admission to the Graduate School or permission of instructor. Repeatable to 6 credits. On demand.

**SOC 540. Seminar in Social Policy. 3 Credits.**
An examination of special topics with a focus on social policy. Prerequisite: Admission to the graduate school or consent of instructor. F, even years.

**SOC 569. Introduction to Social Entrepreneurship. 3 Credits.**
The purpose of this course is to introduce students to the topics of social entrepreneurship, social entrepreneurs, how social entrepreneurship can become a tool for social change, social science theories and research on social entrepreneurship. Prerequisite: Admission to the Certificate Program in Social Entrepreneurship. S.

**SOC 592. Research Experience in Sociology. 1-5 Credits.**
Designed for students who are working on research under the direction of one or more faculty. This course provides the opportunity for guided experience in applied research projects. Prerequisite: Consent of instructor. Repeatable to 5 credits. S/U grading. S.

**SOC 594. Readings in Sociology. 1-5 Credits.**
Designed for students who want additional instruction in sociological topics. Specific arrangements must be made with the instructor prior to registration. Prerequisite: Consent of instructor. Repeatable to 5 credits. F.S.

**SOC 599. Internship in Sociology. 1-5 Credits.**
A learning experience in a selected community agency or organization determined by the student's area of interest. The student will select a Sociology professor to oversee the internship, and it is with this professor that the student will complete a contract for the course prior to enrolling. Fieldwork is under the supervision of agency personnel. Two to three hours per week are required in the field per credit hour for each week of the semester. Prerequisite: Consent of instructor. Repeatable to 5 credits. S/U grading. F.S.

**SOC 996. Continuing Enrollment. 1-12 Credits.**
Repeatable. S/U grading.

**SOC 998. Thesis. 1-9 Credits.**
Maximum of 9 credits. Repeatable to 9 credits.

Undergraduate Courses for Graduate Credit

**SOC 407. Political Sociology. 3 Credits.**
Sociological analysis of political and parapolitical groups; voting behavior; political socialization process; power elites, societies and systems of government; power structures. On demand.

**SOC 431. Workplace Dynamics. 3 Credits.**
This course focuses on understanding contemporary workplace dynamics, informed by how the organization of work has changed across time. Theories underlying the organization of work are examined, with an emphasis on how workplaces are shaped by larger social forces, how they shape society, and how they intersect with other organizations. The course concludes with an exploration of diversity in the workforce, especially the ramifications of social class, gender, and race/ethnicity in organizational settings. On demand.

**SOC 435. Racial and Ethnic Relations. 3 Credits.**
A survey of major USA racial and ethnic groups, the histories of their social encounters, and the theoretical perspectives associated with their experiences. On demand.

**SOC 436. Social Inequality. 3 Credits.**

**SOC 437. Population. 3 Credits.**
A basic consideration of formal and social demography. The determinants and consequences of population change. On demand.

**SOC 450. Deviant Behavior. 3 Credits.**
This course examines the nature, types and societal reactions to deviant behavior; special emphasis on the process of social typing, regulation of deviance, deviant subcultures, and identities. On demand.

**SOC 492. Research Experience in Sociology. 1-5 Credits.**
Students enrolled in this practicum work on a research project under the direction of one or more faculty. The practicum is designed to provide hands-on research and/or statistical experience for those enrolled. Repeatable for a maximum of 10 credits. Repeatable to 10 credits. S/U grading. F.S.

**SOC 494. Readings in Sociology. 1-5 Credits.**
Designed for students who want instruction in subjects not covered adequately in usual course offerings. Specific arrangements must be made with the instructor prior to registration. Prerequisite: Consent of instructor. Repeatable to 10 credits. F.S.

Space Studies

http://www.space.edu/

FACULTY: Casler (Chair), de León, Dodge (Graduate Program Director), Fevig, Gaffey, Hardersen, Rhygalov, and Seelan

Degree Granted: Master of Science (M.S.)

The Department of Space Studies offers graduate studies leading to the Master of Science degree. Non-thesis and thesis options are available. The all-encompassing nature of space exploration requires people who possess broad backgrounds that link policy, business, law, science and engineering. The Department of Space Studies seeks to train this vital segment of the community through the non-thesis option. The goal is to integrate, rather than separate, traditional disciplines related to space. Specialized training is also an essential
part of the space community and this is achieved through the thesis option that gives students the opportunity to specialize in an area of faculty research.

Our programs are designed to prepare students for futures in the academic, commercial, and governmental sectors of the rapidly growing field of space exploration and development.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

**Master of Science (M.S.)**

**Mission Statement and Program Goals**

The mission of the Department of Space Studies is to provide a comprehensive world-class education in the academic area of space. Key elements of this education are interdisciplinary and multidisciplinary breadth and disciplinary depth, delivered on-campus, and through innovative distance delivery methods. Our objectives focus on producing students that will become the decision and policy makers, managers, negotiators, engineers, technicians, educators and scientists of the space arena.

**Facilities for Graduate Research**

The department is located on the fifth floor of the 71,500 square-foot Clifford Hall constructed in 1992 as part of the John D. Odegard School of Aerospace Sciences complex on the west end of the UND campus. Our facilities include lab space for the investigation of terrestrial rocks and meteorites, reduction and analysis of terrestrial remote sensing and planetary reflectance spectral data, research into life support technologies and human factors in space, and an astronomical observatory.

The department manages the UND Observatory complex, which is located ten miles west of Grand Forks and two miles southeast of Emerado. The Observatory currently includes three remotely-controllable optical telescopes (two 16-inch and one 10-inch aperture, respectively). UND Observatory telescopes support student thesis and non-thesis astrometric, broadband photometric, and stellar spectrographic research. A Human Spaceflight Laboratory with several experimental planetary suits is available for student research, as well as a Space Simulators Facility with a vertical and horizontal Space Simulator to replicate different phases of suborbital and orbital flight. The lab also includes elements of a planetary base concept, consisting of an inflatable lunar habitat and pressurized electronic rover which is designed to connect externally to the space suits.

A Space Life Sciences Laboratory is open to students specializing in long-term space physiology, life support scenarios and hardware design.

**Aerospace Sciences Degree (Ph.D.)**

http://www.aero.und.edu/

**FACULTY:** (Avit) Anderson, Bjerke, Bridewell, Drechsel, Higgins, Jensen, Kenville (Graduate Program Director), Lindseth, Petros, Robertson, Smith, Ulrich, Vacek, Verhuizen and Watson

**FACULTY:** (SpSt) Casler (Chair), de León, Dodge (Graduate Program Director), Fevig, Gaffey, Hardersen, Rygalov, and Seelan

**Ph.D. in Aerospace Sciences**

The Doctor of Philosophy degree in Aerospace Sciences is a joint program between the Department of Aviation and the Department of Space Studies within the John D. Odegard School of Aerospace Sciences. Please refer to the Aerospace Sciences Ph.D. program entry in the graduate section of the catalog.

**Mission Statement and Program Goals**

The mission of the Aerospace Sciences Ph.D. program is to provide interdisciplinary teaching and research at the highest academic levels. The goal is to provide highly educated scholars and leaders with the skills necessary to mix technology and science with an understanding of the politics and economics of the aerospace fields.

1. Students will develop a thorough knowledge of the aerospace elements specifically related to the Aviation and Space Studies disciplines that will allow them to be successful leaders in the industry by applying solutions gained through theory and applied research.
2. Students will enhance their analytical, technical, research and communication skills through classroom and research activities to further develop an ability to carry out independent, original and applied research.
3. Students will further develop the critical skill set needed to enable them to fill leadership roles within government and research agencies, educational institutions or private aerospace and aviation sector companies.

**Master of Science (M.S.)**

**Admission Requirements**

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. The deadlines for applying for admission for each semester are as follows: April 30 for the Fall semester; October 31 for the Spring semester; and February 28 for the Summer semester. Students who apply after these dates for a given semester are encouraged to do so under non-degree status. The requirements for admission to the Space Studies degree program are as follows:

1. Bachelor’s degree from an accredited college or university with an overall grade point average (GPA) of 2.75 or better, or a GPA of at least 3.0 for the junior and senior years of undergraduate work.
2. Three credits of coursework in statistics or algebra or calculus or computer science.
3. Six credits of coursework in the physical sciences, life sciences, or engineering.
4. Six credits of coursework in the social sciences, history, business, or law.
5. Three credits of coursework in English composition or technical writing.
6. Pre-requisite courses from 2 to 5 above must have been completed at the college level, preferably with a grade of B or higher.
7. The Graduate Record Examination (GRE) General Exam if you plan on seeking funding (GRAs, tuition waivers) via the department or a faculty member. Otherwise, it is not required for admission to the MS program.
8. Submission of a written statement of interest highlighting the candidate’s interest in space studies and motivation to undertake this program.
9. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Financial Assistance**

Graduate assistantships (GTA/GRA) are available from a variety of internal and external sources. These are awarded on the basis of academic merit and students’ abilities to contribute to departmental research and teaching. Students desiring graduate assistantships must take the GRE. The deadlines for applying for financial aid through the Department of Space Studies for a given semester are as follows: April 30 for the Fall semester; October 31 for the Spring semester; and February 28 for Summer semester. Funding is renewable if progress toward the degree, research goals and teaching are satisfactory. Support is typically for two years on a nine-month basis. Summer funding may also be available.

**Degree Requirements**

All students are required to complete a minimum of 33 credits. The following plan should be used:

1. SPST 501 Survey of Space Studies I and SPST 502 Survey of Space Studies II (6 credits).
2. Students select either the non-thesis or thesis option and declare which social or technical area is their area of specialization. This is the area in which they do their SPST 997 Independent Study Report or SPST 998 Thesis.
3. Two (2) courses from designated social area courses outside the student’s area of specialization (6 credits).
4. Two (2) courses from designated technical area courses outside the student’s area of specialization (6 credits).

Note: The choice of courses in the required social and technical areas outside the student’s area of specialization must take into account the breadth of disciplines, which is a critical part of Space Studies education. In
Aerospace Sciences Degree (Ph.D.)

Admission Requirements

The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog. All elements must be complete by the published application date. The additional requirements for admission to the Aerospace Sciences Ph.D. program are as follows:

1. A Master’s or graduate degree from an accredited institution with a GPA of at least 3.25/4.0
2. Submission of a statement of personal goals
3. Professional resume
4. Satisfy the School of Graduate Studies English Language Proficiency requirements as published in the graduate catalog.
5. The Graduate Record Examination (GRE) General Exam
6. Industry experience preferred

Financial Assistance

Financial aid in the form of teaching, research or service assistantships and tuition waivers are available from a variety of internal and external sources and are awarded on a competitive basis. These appointments are renewable if students are making satisfactory progress toward the degree and their work is satisfactory. Applications for funding opportunities should coincide with the program application date.

Degree Requirements

- Ninety credits beyond a baccalaureate degree. With approval of the Aerospace Sciences Ph.D. Program and the UND School of Graduate Studies, up to thirty credits from a master’s degree from an accredited institution can be applied toward the requirements of the doctoral degree.
- Successful completion of sixty semester credits beyond the master’s degree
- Successful completion of qualifying exam prior to advancement to candidacy
- Twelve to eighteen semester credits of dissertation (AVIT 999 Dissertation or SPST 999 Dissertation) and successful defense of the dissertation
- Required core courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 501</td>
<td>General Issues in Aviation/Aerospace</td>
<td>3</td>
</tr>
<tr>
<td>SPST 501</td>
<td>Survey of Space Studies I</td>
<td>3</td>
</tr>
</tbody>
</table>

- Six to twelve semester credits of Scholarly Tools beyond the Master’s degree requirements
- Remaining coursework from Aviation/Space Studies or other UND approved Graduate Courses
- Residency requirement: as determined by student’s advisor and/or committee, at a minimum the student will be required to be on campus for one week per year.

There are four required core courses, in addition to the Scholarly Tools component. These courses may have been part of the student’s MS program and cannot be counted twice.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>AVIT 501</td>
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<td>3</td>
</tr>
<tr>
<td>SPST 501</td>
<td>Survey of Space Studies I</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 521</td>
<td>Ethics in Aerospace</td>
<td>3</td>
</tr>
<tr>
<td>SPST 998</td>
<td>Thesis</td>
<td>6-12</td>
</tr>
</tbody>
</table>

The Scholarly Tools requirement is 6 to 12 semester credits, to be determined by the student’s advisor and/or committee, from the courses listed below. These courses are in addition to what may transfer as part of the student’s Master’s degree program. Therefore, a minimum of six credits will be required as part of the Ph.D program.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 503</td>
<td>Statistics (or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 504</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>SPST 504</td>
<td>Research Methods in Space Studies</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 505</td>
<td>Qualitative Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 506</td>
<td>Quantitative Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 507</td>
<td>Advanced Research Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

Course Designations (SPST)

Social area courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPST 450</td>
<td>International Space Programs</td>
<td>3</td>
</tr>
<tr>
<td>SPST 540</td>
<td>Space Economics and Commerce</td>
<td>3</td>
</tr>
<tr>
<td>SPST 541</td>
<td>Management of Space Enterprises</td>
<td>3</td>
</tr>
<tr>
<td>SPST 545</td>
<td>Space and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>SPST 551</td>
<td>History of the Space Age</td>
<td>3</td>
</tr>
<tr>
<td>SPST 552</td>
<td>History of Astronomy and Cosmology</td>
<td>3</td>
</tr>
<tr>
<td>SPST 555</td>
<td>Military Space Programs</td>
<td>3</td>
</tr>
<tr>
<td>SPST 560</td>
<td>Space Politics and Policy</td>
<td>3</td>
</tr>
<tr>
<td>SPST 561</td>
<td>Public Administration of Space Technology</td>
<td>3</td>
</tr>
<tr>
<td>SPST 565</td>
<td>Space Law</td>
<td>3</td>
</tr>
<tr>
<td>SPST 574</td>
<td>Remote Sensing in Developing Countries</td>
<td>3</td>
</tr>
<tr>
<td>SPST 575</td>
<td>Remote Sensing Law and Policy</td>
<td>3</td>
</tr>
<tr>
<td>SPST 581</td>
<td>Field Visit to Space Centers</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Technical area courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPST 405</td>
<td>Space Mission Design</td>
<td>3</td>
</tr>
<tr>
<td>SPST 410</td>
<td>Life Support Systems</td>
<td>3</td>
</tr>
<tr>
<td>SPST 425</td>
<td>Observational Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>SPST 430</td>
<td>Earth System Science</td>
<td>3</td>
</tr>
<tr>
<td>SPST 435</td>
<td>Global Change</td>
<td>3</td>
</tr>
<tr>
<td>SPST 460</td>
<td>Life in the Universe</td>
<td>3</td>
</tr>
<tr>
<td>SPST 500</td>
<td>Introduction to Orbital Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>SPST 505</td>
<td>Spacecraft Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SPST 506</td>
<td>Advanced Orbital Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>SPST 512</td>
<td>Human Performance in Extreme Environments</td>
<td>3</td>
</tr>
<tr>
<td>SPST 515</td>
<td>Human Factors in Space</td>
<td>3</td>
</tr>
<tr>
<td>SPST 519</td>
<td>Closed Ecological Systems for Life Support</td>
<td>3</td>
</tr>
<tr>
<td>SPST 520</td>
<td>Asteroids, Meteorites and Comets</td>
<td>3</td>
</tr>
<tr>
<td>SPST 521</td>
<td>The Planet Mars</td>
<td>3</td>
</tr>
</tbody>
</table>
AVIT 511. Aviation Information Technology, 3 Credits.
This course is an introduction to information systems essential to an aviation business professional. It will provide an overview of current and emerging technologies in various database, data communication and e-commerce systems.

AVIT 512. Aviation Environmental Issues, 3 Credits.
This course examines current environmental issues within the aviation industry in the context of historical environmentalism, current laws and regulations, and emerging research findings. A broad survey of earth systems precedes a focused examination of contemporary aviation environmental issues.

AVIT 513. Aviation Safety Management Systems, 3 Credits.
An in-depth study of aviation safety management concepts and principles as they relate to effective safety programs within the airlines, corporate aviation, general aviation and airports.

AVIT 514. Aviation Management Theory, 3 Credits.
An in-depth review of organizations in the aviation industry, their structures, environments and leadership as it relates to human behavior. Topics include organizational design, climate and the interactions with individuals, groups, and different organizational structures within the airline, general aviation, corporate aviation and airport organizations.

AVIT 515. Human Factors: Human Perceptions in Information Systems Design, 3 Credits.
Human perception and information processing will be discussed in relation to information system design requirements to optimize human performance. Topics include information systems design with regard to compatibility, perception, attention, situation awareness and decision processes. Applications to current workstation design will allow students to have a greater understanding of human centered design goals.

AVIT 516. Training System Design, 3 Credits.
The process of memory, learning, and judgment will be related to instructional design strategies in the aviation industry, where heavy use of simulation is used in the training and evaluation of aviation professionals. Topics include instructional design and assessment concepts, simulation design and decision making skills. Class presentations include operational problem-solving group work as well as research paper reviews.

AVIT 517. Airline Labor Relations and Law, 3 Credits.
This course will examine the impact and application of the Railway Labor Act as it pertains to airline operations. Topics of study will include labor history; organization; alternative dispute resolution, collective bargaining, including interest-based practices; and emerging labor trends.

AVIT 518. Human Error, 3 Credits.
The objective of this course is to develop a deeper understanding of the human error and its impact upon human performance in variety of fields. Prerequisite: Graduate Admission. S.

AVIT 520. Strategic Airport Planning, 3 Credits.
This course will explore the elements of airport planning within the public administration domain. Emphasis will be placed on individual airport’s strategic plans, how airports operate efficiently and effectively with changing regulations and economic fluctuations in the global marketplace.

AVIT 521. Ethics in Aerospace, 3 Credits.
The course will introduce ethical concepts and frameworks used in professional decision-making. Students will engage with faculty and outside speakers to weigh decisions in the applicable ethical frameworks. Students participation will include graded elements of formal case presentations, class discussion sessions, essay examinations and review of scholarly and trade journal articles. The course will have a strong emphasis on research project design to assess dynamics of ethical decision-making in different populations, as well as exploring educational opportunities in the aerospace industry.

AVIT 522. UAS Management, 3 Credits.
This course provides a series of lectures or presentations by visiting lecturers or faculty on various topics related to Unmanned Aircraft Systems (UAS). Prerequisite: Graduate Student Status. F, odd years.
AVIT 523. Aviation Safety Data Analysis. 3 Credits.
The objective of this course is to obtain an understanding of various safety programs conducted throughout the aviation industry and examine the underlying analytical techniques associated with each program. Prerequisite: Graduate student status. SS.

AVIT 524. Air Traffic Management. 3 Credits.
This course will explore the elements of Air Traffic and Next Gen. There will be a discussion on how air traffic control works and the evolution of the Air Traffic Management of the National Airspace System in the US and abroad. Emphasis will be on the current day issues and how Air Traffic Management is changing not only in the US but in Canada, Europe and worldwide. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science, The Aerospace PhD program, or consent of the instructor. SS, even years.

AVIT 525. Legal Issues in Aviation. 3 Credits.
The course will introduce legal concepts and frameworks of the United States' legal system. Issues particular to the aviation industry will be discussed. Students will engage in formal case presentations and discussions to gain an understanding of the legal issues faced in the aerospace industry. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science program, the Aerospace PhD program, or consent of the instructor. SS, even years.

AVIT 587. Supervised Field Work. 1-3 Credits.
Used primarily for individualized field placement so that the student may acquire practical experiences in the aviation industry. Prerequisite: Consent of graduate director. Repeatable to 6 credits. S/U grading.

AVIT 590. Aviation Seminar. 1-3 Credits.
A series of lectures presented by visiting lecturers and the faculty. Repeatable to 9 credits.

AVIT 591. Readings in Aviation. 1-3 Credits.
Readings in selected Aerospace Studies topics, with written and/or oral reports. Prerequisite: Consent of instructor. Repeatable to 6 credits.

AVIT 593. Individual Research in Aviation. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits for Master's and up to 12 credits for Ph.D. Repeatable to 6 credits.

AVIT 595. Aviation Capstone. 3 Credits.
The Capstone course integrates, extends, and applies knowledge learned in earlier Aviation courses and research projects. The course also undertakes an in-depth study of management theories relevant to the aviation industry and how leaders applies these theories in practice. Students will have the opportunity to demonstrate their knowledge and leadership abilities by working in teams to design and develop a solution to a current aviation problem, which will be assigned by the instructor. This effort will culminate in an on-campus presentation to the faculty and invited industry experts. Prerequisite: AVIT 504 or permission of instructor.

AVIT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

AVIT 997. Independent Study. 2 Credits.
Independent study and preparation of a written report for students taking the non-thesis option in the Master's program.

AVIT 998. Thesis. 4 Credits.
Preparation and defense of a thesis based on original research. Prerequisite: Admission committee approval and consent of instructor. Repeatable to 4 credits.

AVIT 999. Dissertation. 1-12 Credits.
An original research project approved by and completed under the supervision of a dissertation committee. Prerequisites: Graduate standing, approval, completion, and defense of dissertation proposal. Repeatable to 18 credits.

SPST Courses

SPST 500. Survey of Space Studies I. 3 Credits.
SPST 500 is the first course in a two-course sequence (along with SPST 502) in Space Studies that introduces new students to essential knowledge that will be necessary to successfully complete their M.S. degree in space studies. SPST 501 consists of the following six modules: 1) space history, 2) space policy, 3) space law, 4) planetary and space sciences, 5) space life sciences and human factors, and 6) Earth remote sensing. All modules contain foundational information that will provide students the basic knowledge and skills necessary to achieve a broad understanding of the multi- and interdisciplinary nature of space studies; knowledge that can be applied in later courses, such as Capstone; and knowledge that facilitates thesis and other specialized types of instruction and research. Course content in SPST 501 will also be used to assess student learning at the end of their M.S. program via the Comprehensive Examination. Students are expected to master and understand course content, be able to apply course content as appropriate, and demonstrate their understanding of course content prior to graduation. F.

SPST 502. Survey of Space Studies II. 3 Credits.
SPST 502 is the second course in a two-course sequence (along with SPST 501) in Space Studies that introduces new students to essential knowledge that will be necessary to successfully complete their M.S. degree in space studies. SPST 502 consists of the following five modules: 1) space mission design (two modules), 2) orbital mechanics, 3) launch vehicles and propulsion, and 4) robotic spacecraft instrumentation. All modules contain foundational information that will provide students the basic knowledge and skills necessary to achieve a broad understanding of the multi- and interdisciplinary nature of space studies; knowledge that can be applied in later courses, such as Capstone; and knowledge that facilitates thesis and other specialized types of instruction and research. Course content in SPST 502 will also be used to assess student learning at the end of their M.S. program via the Comprehensive Examination. Students are expected to master and understand course content, be able to apply course content as appropriate, and demonstrate their understanding of course content prior to graduation. S.

SPST 504. Research Methods in Space Studies. 3 Credits.
This course will provide an introduction to research in Space Studies emphasizing the preparation of a Ph.D. proposal and the dissertation itself. Course content will be tailored to address the specific research methods applicable to the student(s) research interests. Typically given by the student's advisor, but students preparing in the same area (e.g., Planetary Science, Astronomy) may be in a combined section. On demand.

SPST 505. Spacecraft Systems Engineering. 3 Credits.
This course will guide the students through the spacecraft design and proposal process for an actual mission. In this course the students will work in teams on individual spacecraft subsystems, participate in an engineering design review, and create a document which can be submitted for funding for a small satellite project. Lectures will provide an overview of the separate spacecraft subsystems involved in a typical mission, the systems engineering approach to spacecraft development, and the grant writing process. Distance students will interact with on-campus students via conferencing software. Prerequisite: SPST 405 or consent of instructor.

SPST 506. Advanced Orbital Mechanics. 3 Credits.
This course provides a working knowledge of the field of orbital mechanics including the use of appropriate mathematical and computational techniques, the analysis of professional papers in orbital mechanics, and applying the appropriate techniques to solve orbital mechanics problems. Topics covered include orbital elements, perturbations, coordinate systems, orbit determination, and multi-body gravitational problems. Prerequisites: SPST 500, and MATH 266 or equivalent.

SPST 508. Quality Engineering for the Space Industry. 3 Credits.
This course addresses the principles and techniques for establishing quality goals, identification of customer needs and requirements, measurement of quality, and product/process engineering to improve system performance with a focus on the space industry. The main objectives are to provide the student with an understanding of the principles and practice of quality and reliability engineering in general and to provide an in-depth understanding of the quality assurance concepts, strategies, and tools practiced in the space industry. Familiarity with the techniques learned in this course will enable the student to address problems in the design, implementation, measurement, and correction of production and service systems found in the space industry. On demand.
SPST 512. Human Performance in Extreme Environments. 3 Credits.
This course introduces the area of human performance in extreme environments, highlights differences and similarities between extreme environments, and demonstrates the lessons learned from one extreme environment can be effectively applied to others–though settings like space, mountains, or the ocean's depths, etc. pose unique characteristics, the human physiological and psychological reactions and adaptations to these extreme settings stay similar.

SPST 515. Human Factors in Space. 3 Credits.
A review of the major stresses experienced by humans on entering the new and alien environment of space. Examples will be taken from the psychological and physiological impacts experienced by U.S. and Soviet crews with emphasis on longer flights. How to avoid and/or overcome these stresses will be examined as an essential and growing need in the future development and settlement of the space frontier.

SPST 517. Human Spaceflight Systems. 3 Credits.
This course is designed to introduce students to human space systems. The course uses both an engineering and a historical approach to human spaceflight systems covering all manned spacecraft up to today, plus individual subsystems necessary for human occupation. By the end of the course, students will: 1. Understand the engineering and science concepts related to human spaceflight, 2. Understand the major technologies required for human spaceflight, 3. Apply the systems engineering process to a human spaceflight mission: a. Describe the interactions among the elements of a space mission, b. Describe the interactions among all spacecraft subsystems, c. Document design decisions and analysis in a clear and concise manner. F, even years.

SPST 519. Closed Ecological Systems for Life Support. 3 Credits.
Closed ecological systems have been suggested during the early decades of space exploration for extended life support in space operations. In reality, this principle of long-term life support mimics global biogeochemical cycles supporting life on Earth. The course covers the multiple interactions of human/bioregenerative life support based on physical/chemical regeneration (hybrid) life support environments. Extensive research in this area during more than five decades showed that material turnover in small closed environments becomes unstable compared to a planetary environment. Specific attention is paid to the limits of stability for closed material cycles functioning during long-term remote confined missions; and the importance of the human factor as a target link, main sensor, and main integrator and control element for the system providing significant self-sustainability under proper motivation. Advanced scenarios for space life support based on ecological and in situ resource utilization approaches are discussed. On demand.

SPST 520. Asteroids, Meteorites and Comets. 3 Credits.
The small bodies of the solar system provide clues to the origin and early history of the solar system. The planets and larger moons have all been chemically transformed erasing their records of their formation. By contrast, many asteroids, meteorites and comets are essentially unmodified from the time of their origin 4.5 billion years ago and thus preserve a record of the formation epoch. Each of these classes of objects is investigated separately, and relationships between them are examined. Implications for impact hazards and for extraterrestrial resources are also explored. The results of recent and current spacecraft missions to asteroids (e.g., Galileo, NEAR, DAWN, Hayabusa, Rosetta, OSIRIS-Rex, etc.) and to comets (e.g. Giotto, Vega 1, Stardust, Deep Impact, Rosetta, etc.) are reviewed. On demand.

SPST 521. The Planet Mars. 3 Credits.
This course provides an in-depth review of the present state of our knowledge of the planet Mars. Topics that are covered include: the origin and evolution of the planet, the surface geology and geological processes, the geophysical properties of the Martian interior, the origin and evolution of the Martian atmosphere, the present and past climates of Mars, the Martian moons, and the possibility of past or present life on Mars. The American, Soviet/Russian and other nations’ Mars exploration programs are reviewed and the course incorporates the most recent results from spacecraft missions such as Mars Odyssey, the Mars Exploration Rovers (Opportunity Spirit), Mars Express (European Space Agency), Mars Reconnaissance Orbiter, Mars Science Laboratory (Curiosity Rover), MAVEN, and Mangalyaan (India’s Mars Orbiter Mission). Potential future manned and unmanned missions are also discussed. On demand.

SPST 522. Remote Sensing Principles. 3 Credits.
This course covers the basic concepts and foundations of remote sensing, a review of major Earth observing satellite and aircraft platforms, and an investigation of flow of data from satellite to Earth, what it represents, and how to interpret it, using both visual and digital image processing techniques. A field visit to the EROS Data Center in Sioux Falls may also be arranged.

SPST 523. Remote Sensing Applications. 3 Credits.
This course covers the use of advanced image processing algorithms and information extraction techniques for various Earth resource applications such as land cover/land use, environmental change detection, geology, oceanography, agriculture, forestry, rangeland, water resources, urban planning, natural disaster management, etc. Prerequisite: SPST 522.

SPST 524. Current Topics in Astrobiology. 3 Credits.
This is a multi-disciplinary, literature-intensive examination of astrobiology, which is the study of life in the universe. Students will read scientific research and review papers from a variety of disciplines including astronomy, planetary science, chemistry, biology, and geology. Course goals include: developing proficiency at reading/analyzing diverse scientific papers, developing the ability to incorporate knowledge from multiple disciplines in the study of astrobiological research, and developing the ability to effectively write summary papers to show basic understanding of course material. Prerequisite: SPST 460 or consent of instructor. On demand.

SPST 525. Technical Issues in Space. 1-3 Credits.
An examination of the technological base for the exploration and development of space. An understanding of this technology and of its impact is essential to an understanding of the issues and problems associated with our continuing efforts to explore and settle this new frontier. May be repeated if the topic is different. Repeatable.

SPST 526. Astronomical and Spacecraft Instrumentation. 3 Credits.
This course will concentrate on instrument design, operation, and the resulting data products generated by ground- and space-based astronomical observatories, as well as common instrumentation used in NASA scientific solar system spacecraft. Key goals for this course include gaining a solid understanding of instrumental principles of operation, the types of raw data that are generated, and the types of data reduction processes that lead to interpretable data. The course will include an investigation of different types of spectographs and spectroscopy data products, solar instrumentation (ground- and space-based), terrestrial and Jovian spacecraft orbiter/flyby instrumentation, terrestrial planet rover and lander instrumentation, and extra-solar system astrophysical instrumentation. Students will have the opportunity to examine, reduce, and interpret select data sets. Prerequisites: SPST 425 and MATH 165 or consent of instructor. On demand.

SPST 527. Extraterrestrial Resources. 3 Credits.
This course focuses on the inventory, accessibility, acquisition, processing and utilization of extraterrestrial resources (space resources) from celestial bodies such as the Moon, Mars, asteroids and comets. Consideration will be given to extraterrestrial resources for in situ utilization (such as a Lunar or Martian base), for space operations (such as supporting large scale near-Earth activities or a human Mars mission), and for terrestrial markets. The course will focus on the interplay between the scientific, technical, and economic aspects of acquiring and utilizing such resources. The course will also explore some of the legal and political ramifications and limitations of claiming and recovering space resources. On demand.

SPST 528. Space Environment and the Sun. 3 Credits.
This course will provide an in-depth study of the science and observations of the Sun, space weather, and effects of the Sun on astronauts, Earth, and the space environment. Topics that will be covered include the solar photosphere and active surface phenomena such as sunspots, flares, and coronal mass ejections; the nature of the quiet Sun; the solar interior and helioseismology; space weather and impact of solar particles on the space environment and Earth; the hazards posed to astronauts by solar eruptions; common techniques of solar observations; and a review of the primary types of solar instrumentation and the observatories that currently study the Sun. Students will be able to observe the Sun using the UND Observatory’s small solar telescopes; all students will have the opportunity to analyze solar datasets to aid their understanding of the Sun. Prerequisite: MATH 165 or consent of instructor. On demand.
SPST 540. Space Economics and Commerce. 3 Credits. A study of the economic aspects of space activities, with analysis of the possibilities and the barriers. Key areas include launch services, satellite communications, remote sensing, microgravity materials processing, and interaction with the government. Global competition against subsidies or government-sponsored entities is examined. On demand.

SPST 541. Management of Space Enterprises. 3 Credits. This course investigates the management of space organizations. These include organizations that are public and private, RD and operations, profit and non-profit. You will learn the basics of management theory, the history of systems management, and the technical issues that must be considered in the management of space RD and operations. On demand.

SPST 542. Risk Management of Space Organizations. 3 Credits. This course includes a systematic approach to the principles and practices of risk management in the space industry from project initiation through planning, implementation, control and closeout. It discusses various techniques and models for qualitative and quantitative risk assessment and risk mitigation in such areas as cost, schedule, and performance. Decision making under conditions of uncertainty and risk is also discussed. On demand.

SPST 545. Space and the Environment. 3 Credits. This course is an advanced graduate-level review of international relations theories as applied to the international implications of global commons. The course introduces the concept of global commons, examines the theories and practices concerning management of global commons, and analyzes the global commons dealing with the problems of collective action as applied to global environmental change and the uses of outer space. On demand.

SPST 551. History of the Space Age. 3 Credits. This course introduces students to the history of human endeavors in space. These include the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spacecraft.

SPST 552. History of Astronomy and Cosmology. 3 Credits. This course investigates the history of human endeavors to understand the stars, planets, and cosmos as a whole from a scientific perspective. It covers the early observations and theories of the Babylonians and Greeks through the European Scientific Revolution, and finally to the development of astrophysics and modern cosmology using space vehicles. On demand.

SPST 555. Military Space Programs. 3 Credits. An introduction to military uses of space by the United States, Russia, and other nations. The course introduces ballistic missiles, anti-ballistic missile and anti-satellite systems, space-based reconnaissance and intelligence-gathering, communications, navigation, acquisition, and military space treaties. On demand.

SPST 560. Space Politics and Policy. 3 Credits. This course serves as a graduate-level introduction to the field of Public Policy as applied to Space Policy. The course surveys the evolution of Space Policy at several levels of analysis including context, political actors and institutions, political processes, and policy outcomes, and assesses the symbiotic relationship between policy, technology, and science. On demand.

SPST 561. Public Administration of Space Technology. 3 Credits. This course is an advanced graduate-level review of Public Administration theories as applied to the implementation of space technology programs. In this course, the political, organizational, and technical variables that affect the management processes of space organizations are examined. Prerequisite: SPST 560 or SPST 541. On demand.

SPST 565. Space Law. 3 Credits. This course serves as a graduate-level introduction to the field of Law as applied to Space Law. The course examines the origins and evolution of the laws of outer space from the beginnings of the space age to the present. International laws governing access and use of space, and national laws regulating governmental and commercial activities in space are reviewed and analyzed. On demand.

SPST 570. Advanced Topics in Space Studies. 1-3 Credits. Lecture, discussion and readings on advanced topics of current interest. May be repeated if the topic is different. Repeatable.

SPST 574. Remote Sensing in Developing Countries. 3 Credits. This course will introduce students to remote sensing programs in developing countries and typical remote sensing application areas pertinent to developing countries, such as: potable water, forest fires, vector diseases, environmental degradation, food security, fisheries, floods, droughts, crop pests, etc., with case studies. Prerequisite: SPST 522 or GEOG 475 or consent of instructor. On demand.

SPST 575. Remote Sensing Law and Policy. 3 Credits. This course focuses on the evolving laws, policies, and institutions that have long-term ramifications for earth observations. Some topics addressed are the United Nations Principles on Remote Sensing; the United Kingdom's 1984 National remote sensing policy; the Montreal Protocol; and, the United States Land Remote Sensing Policy Act of 1992. Ground segment institutions considered are the Landsat Ground Stations Operations Working Group and the Global Land 1-KM AVHRR Project. Remote sensing litigation that has begun to address various applications of remote sensing will also be considered, and the impact of remote sensing activities on privacy and constitutional law will be examined. Cases include Dow vs US and EOSAT vs NASA and NOAA. On demand.

SPST 581. Field Visit to Space Centers. 1-3 Credits. This course will provide a first-hand knowledge of selected space centers in the U.S. and/or abroad through an organized field visit. The field visit will be led by a space studies faculty and will include prior preparation through readings, class seminars, lectures and written assignments. May be repeated up to a maximum of 3 credits. Repeatable to 3 credits. S/U grading. On demand.

SPST 590. Space Studies Colloquium. 1 Credit. A series of lectures presented by visiting lecturers and faculty. May be repeated for up to 2 credits. S/U grading.

SPST 591. Readings in Space Studies. 1-3 Credits. Readings in selected Space Studies topics, with written and/or oral reports. Repeatable to a maximum of 6 credits. Prerequisite: Consent of instructor. Repeatable to 6 credits.

SPST 593. Individual Research in Space Studies. 1-3 Credits. Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits for Master's and up to 12 credits for Ph.D. Repeatable to 6 credits.

SPST 595. Space Studies Capstone. 3 Credits. The capstone course integrates, extends and applies knowledge gained in earlier Space Studies courses and reading. The major component of this course is a collaborative team project inter-relating policy, technology and science. This course is required for distance students who select the non-thesis option and can be taken after completing at least 21 credits in the program, or with the permission of the instructor. The course begins in the fall semester and concludes with a required week-long capstone experience on the UND campus in the spring. Prerequisites: SPST 501 and SPST 502. F.

SPST 996. Continuing Enrollment. 1-12 Credits. Prerequisite: Department consent. Repeatable. S/U grading.


SPST 998. Thesis. 1-6 Credits. An original research project approved by and completed under the supervision of a thesis committee. Repeatable to 6 credits. Prerequisites: Graduate standing in Space Studies and completion and approval of a thesis proposal (see department for approval). Repeatable to 6 credits.

SPST 999. Dissertation. 1-12 Credits. An original research project approved by and completed under the supervision of a dissertation committee. Prerequisites: Graduate standing, approval, completion, and defense of dissertation proposal. Repeatable to 18 credits. F.S.SS.

Undergraduate Courses for Graduate Credit

SPST 405. Space Mission Design. 3 Credits. A team design project to develop the requirements for a space mission. The specific mission will vary from time to time. Design teams will work on selected portions of the mission. Accompanying lectures will provide background material. Prerequisite: SPST 200. S.
SPST 410. Life Support Systems. 3 Credits.
A review of the physiological effects of living in space including a discussion of current and near-term life support systems equipment for the provision of oxygen, water, food, and radiation protection. In addition, a review will be made of the issues associated with the development of fully closed ecological life-support systems that will be essential to the long-term development of space. Prerequisite: SPST 200. On demand.

SPST 425. Observational Astronomy. 3 Credits.
This course provides an introduction to observational astronomy and includes three segments: basic observing techniques and astronomical equipment (telescopes, CCDs); visual observing and the characteristics of the night sky; astrometric and photometric observing, data reduction, and interpretations; and image processing and color imaging techniques. Students will learn to operate a remotely controllable Internet telescope and CCD camera. A broadband Internet connection is recommended. Night observing is required. Course fee. Prerequisite: PHYS 110. On demand.

SPST 430. Earth System Science. 3 Credits.
This course begins with a review of the physical sciences of geology, meteorology and oceanography to examine the coupled interactions between the land, atmosphere and oceans. Particular emphasis is placed on remote-sensing techniques for global monitoring of biogeochemical processes. The role of human activities on Earth processes and the consequences of global environmental changes are discussed. The growing use of space-based data sets and the implications of Earth Observing System technologies, including research goals and hardware requirements, are examined. Prerequisite: SPST 200. On demand.

SPST 435. Global Change. 3 Credits.
The current human population represents something unprecedented in the history of the world. Never before has one species had such a great impact on the environment in such a short time and continued to increase at such a rapid rate. Human activities are therefore significantly influencing the Earth's environment in many ways in addition to greenhouse gas emissions and climate change. Anthropogenic changes to Earth's land surfaces, oceans, coasts, and atmosphere and to biological diversity, the water cycle and biogeochemical cycles are clearly identifiable beyond natural variability. This course investigates the many facets of global change issues, and attempts to provide an up-to-date introduction to the study of the Earth's environment. F. even years.

SPST 450. International Space Programs. 3 Credits.
This course will introduce students to the major governmental space programs around the world. The history, activities and future directions of the Russian/Soviet, European/ESA, Chinese, Japanese, Indian and other space programs will be explored. International collaborations between the various programs will also be studied. Prerequisite: SPST 200. On demand.

SPST 460. Life in the Universe. 3 Credits.
This course examines the nature and evolution of life on Earth from its origin to the present time in the context of cosmological evolution, chemical evolution, planetary evolution, biological evolution, and cultural evolution. The possibility of life elsewhere in the universe is considered based on the conditions under which life could arise and flourish. Human changes to the Earth are placed within this context. The future of life on Earth is discussed and the social and cultural implications arising from the discovery of extraterrestrial life are explored. On demand.

Speech-Language Pathology

(See Communication Sciences and Disorders (p. 413))

Theatre Arts

http://www.und.edu/dept/dtheater/

FACULTY: Angelone, Burgess, Cherry, McLennan (Chair) and Reissig

Degree Granted: Master of Arts (M.A.)

The Department of Theatre Arts offers graduate study leading to a Master of Arts degree. The Master of Arts program is designed to prepare students for either a Master of Fine Arts degree or a Ph.D. The program is individualized so that the student may select a special area of emphasis such as acting, directing, design and technical theatre, playwriting, dramatic literature, feminist theatre, cultural studies, or history. Coursework emphasizes both the practical and theoretical aspects of the discipline. An active production schedule provides students with opportunities in all areas.

The Master of Arts program has been designated a Western Regional Graduate Program by the Western Interstate Commission for Higher Education (WICHE) because of its uniqueness and strength. It is, therefore, open to residents of the thirteen western states at resident tuition rates.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Arts (M.A.)

Mission Statement and Program Goals

The mission of the Department of Theatre Arts Master of Arts program is to provide quality educational experiences approved and recognized by the National Association of Schools of Theatre to prepare students for advanced degrees, professional careers, and/or development as teachers. Graduates will demonstrate critical thinking, creative expression, and social responsibility as artists and scholars of Theatre.

Goal 1: The student shall be prepared for continuing graduate study in an MFA or Ph.D. program

Goal 2: The student shall be prepared for a career in professional theatre markets.

Goal 3: The graduate shall be prepared to apply the art and scholarship of theatre art in productions within educational and community settings.

Goal 4: The graduate will be committed to life-long learning and serve the civic good with artistic distinction.

Master of Arts (M.A.)

Admission Requirements

The applicant must meet the School of Graduate Studies’s current minimum general admission requirements as published in the graduate catalog.

1. A four-year bachelor's degree from a recognized college or university.
2. Twenty-three credits of undergraduate coursework in theatre, drama, or a related discipline.
3. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergraduate work (based on A= 4.00).
4. Satisfy the School of Graduate Studies’s English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements

Students seeking the Master of Arts degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Theatre Arts Department.

1. A minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
4. Required Courses:

   5. THEA 500 Introduction to Research in Theatre Arts 2
   6. THEA 501 Seminars in Theatre Arts 6
   5. THEA 504 Dramatic Theory and Criticism 3
   3. THEA 525 Period and Style in Dramatic Production 3
   3. Electives 6
   4. Thesis 4
   24. Total Credits 24
6. Minimum of six credit hours in the production areas, i.e., Acting, Directing, and Design and Technical Theatre courses.

**Courses**

**THEA 500. Introduction to Research in Theatre Arts. 2 Credits.**
Bibliography, research methods, academic writing, and resource materials for graduate work in Theatre Arts.

**THEA 501. Seminars in Theatre Arts. 1-3 Credits.**
Seminars in Dramatic Theory, Theatre History, Dramatic Literature, Performance Theory and topics of special interest to faculty and students on the graduate level. Repeatable. Repeatable.

**THEA 502. Seminar in Dramatic Production and Criticism. 3 Credits.**
Prerequisite: Consent of instructor.

**THEA 504. Dramatic Theory and Criticism. 3 Credits.**

**THEA 525. Period and Style in Dramatic Production. 3 Credits.**
Study of a wide variety of production styles in the staging of dramatic literature from Aeschylus to the present. Prerequisite: THEA 425 or equivalent.

**THEA 537. Graduate Cooperative Education. 1-6 Credits.**
S/U grading.

**THEA 595. Research Problems in Theatre. 1-3 Credits.**
Individual study under the direction of the graduate faculty. Repeatable to 9 credits. Prerequisite: Consent of instructor. Repeatable to 9 credits.

**THEA 996. Continuing Enrollment. 1-12 Credits.**
Repeatable. S/U grading.

**THEA 997. Independent Study. 2 Credits.**
Repeatable to 6 credits.

**THEA 998. Thesis. 1-6 Credits.**
Repeatable to 6 credits.

**Undergraduate Courses for Graduate Credit**

**THEA 336. Lighting for Stage II. 3 Credits.**
The principles, mechanics and design of stage and television lighting; its relationship to set, makeup and costume design; plus laboratory participation in University productions. Prerequisite: THEA 270 or consent of instructor. S, even years.

**THEA 339. Production Design. 3 Credits.**
The development of the entire theatrical event, from conception to closing, with particular attention to the collaboration of various artists, craftsmen, and managers. Prerequisites: THEA 130, THEA 226, THEA 270 and THEA 300, or consent of instructor. S.

**THEA 404. Acting for the Music Theatre. 3 Credits.**
Appreciation of and performance techniques for musical theatre including: voice and movement work, acting, and staging. Prerequisite: Consent of instructor. S, odd years.

**THEA 415. Selected Problems in Theatre Arts. 1-3 Credits.**
Topics of special interest to faculty and students, such as Theatre Management, Women’s Issues in Drama, Polish Theatre and Drama, Improvisation, Scene Painting, and others. Repeatable up to 9 credits. Repeatable to 9 credits. On demand.

**THEA 423. History of the Theatre: Classical, Medieval and Renaissance. 3 Credits.**
The theatre in performance. The origins of theatrical forms and their relationships to acting style, physical theatre and audience with the cultural environment. F, even years.

**THEA 424. History of the Theatre: Seventeenth Century to the Present. 3 Credits.**
A continuation of topics covered in THEA 423 beginning with the Seventeenth Century and continuing to the present. Student need not take THEA 423 prior to enrolling in THEA 424. S, odd years.

**THEA 425. Play Direction II. 3 Credits.**
A continuation of THEA 300 with emphasis on contemporary theories, analysis, research, conceptualization, and implementation. Laboratory experience. Prerequisite: THEA 300 or consent of instructor. S, even years.

**THEA 426. Scene Design for the Stage. 3 Credits.**
The analysis, research, and conceptualization of the physical context of theatre productions. Emphasis on individual creative projects. Repeatable up to 6 hours. Prerequisite: THEA 270. Repeatable to 6 credits. F.

**THEA 427. Costume Design. 3 Credits.**
Elements, principles, and styles of design applied to the visual creation of a dramatic character. Repeatable up to 6 credits. Prerequisites: THEA 260 or consent of instructor. Repeatable to 6 credits. S, even years.

**THEA 471. Advanced Acting III: Shakespeare. 3 Credits.**

**THEA 488. Playwriting. 3 Credits.**
The playwright’s problems as revealed through practice of writing plays; experimental productions of the student’s creative work whenever possible. Repeatable up to 6 hours. Prerequisite: Sufficient background in theatrical arts and creative writing and consent of instructor. Repeatable to 6 credits. F, odd years.

**University Courses**

**UNIV 529. Study Abroad.**
1 to 12 credit equivalents in any one semester (repeatable with permission of the student’s academic department); course required of students studying abroad to maintain full-time status; required prior approval from Graduate School; prior to registration, students will be involved in study abroad procedures inclusive of study abroad application, pre-departure orientation, credit transfer, and related study abroad processes outlined in the Study Abroad Handbook; courses to be taken during the study abroad semester must have pre-approval of the Graduate School, and grades earned will replace this marker course upon completion of credit transfer back to UND. Repeatable. F,S,SS.

**UNIV 994. Professional Internship. 1 Credit.**
1 credit, repeatable up to 3. Prerequisite: Graduate standing in major department and consent of the Graduate School. Students are placed in approved sites and are engaged in full-time professional practice to acquire knowledge and skills related to their area of study. Supervision must meet criteria established by the Program and the Graduate School. May be repeated up to three consecutive semesters. Enrolled students are granted full-time equivalent student status by the University. SP/UP grading except for the last semester of enrollment which is S/U grading only. Prerequisite: Graduate students admitted to Clinical Psychology or Counseling Psychology. Repeatable to 3 credits.
John D. Odegard School of Aerospace Sciences

Paul Lindseth, Dean

Mission and History

The mission of the John D. Odegard School of Aerospace Sciences is to preserve, create, and disseminate knowledge and to demonstrate the principle use of knowledge for and about aviation, atmospheric sciences, space studies, earth system science and policy, and computer science. In consort with other units of the University of North Dakota, it is committed to providing a comprehensive, high quality, relevant education for students preparing for careers in these fields.

Always at the forefront of technology, the School has earned national and international acclaim for its achievements in collegiate education, particularly in aviation. The School has received a steady stream of multi-million dollar research contracts and attracts students from every state and more than 50 foreign countries.

The aviation program was founded in 1968 as an academic department within the College of Business and Public Administration. It offered the nation’s first four-year degree that combined an undergraduate business degree with an in-depth aviation education and professional flight training. Since then, new degree options and research programs have emerged at a rapid pace. In 1982, the Department of Aviation became the Center for Aerospace Sciences, now a degree-granting college within the University.

In 1992, the Center’s aviation degree programs became the first nationally accredited program recognized by the Council on Aviation Accreditation. In 1998, the Center was renamed the John D. Odegard School of Aerospace Sciences, in honor of its founder and first Dean, John D. Odegard.

Scope

The college is comprised of five academic departments and four major research and support organizations. The Department of Aviation offers undergraduate and graduate degrees in aerospace fields including flight, air traffic control, aviation business and management, unmanned aircraft systems, and aviation education, as well as a master’s degree in aviation and a doctoral degree in aerospace sciences. With its roots in research, the Department of Atmospheric Sciences undergraduate, masters and doctoral programs offer students unique opportunities to participate in funded research and operational forecasting enterprises, including airborne measurements, numerical modeling, remote sensing, and surface transportation meteorology, to name a few. The graduate program within the Department of Space Studies offers an interdisciplinary approach to space exploration, research, and development. A master’s degree and undergraduate minor in space studies are available through the Department, along with a doctoral degree in aerospace sciences. The Department uses extra-terrestrial resources in its study of the broad area of activities beyond earth’s atmosphere. In addition to presenting the current and future technology needs, the program examines the social, political, economic, and legal issues of this new human experience. Computers are transforming almost every industry, especially the aerospace industry. To meet this challenge, the Department of Computer Science became a part of the School in 1982 offering undergraduate and graduate degrees. The doctoral degree is an interdisciplinary program and provides instruction in scientific computing that emphasizes the development of software, the science, and the technology required to support computational science. The newest academic department of the college, Earth System Science and Policy, provides an integrated and creative learning environment, fostering intellectual growth, critical thinking and practical engagement in research and management of the Earth system and resources. ESSP is at the intersection between science and human needs, i.e., Sustainability Science. Two masters degrees and one doctoral program are offered through the department. With the establishment of a joint Doctor of Philosophy degree in Aerospace Sciences between the Department of Aviation and the Department of Space Studies, the John D. Odegard School of Aerospace Sciences now has a doctoral program in each of its departments which fosters a strong research environment for all of its students and faculty.

To facilitate its unique mix of activities, the School has formed four major support organizations. The Scientific Computing Center supports the high performance computing needs of the college for research, academic, and administrative functions. The college’s Regional Weather Information Center houses high performance computing systems and weather data acquisition and processing systems to support atmospheric research. The School for Aerospace Sciences is the home of a unique multimedia production facility called the AeroSpace Network. It supports distance learning activities via satellite and internet, develops state-of-the-art multimedia classroom presentation tools for faculty, and develops computer-based instructional materials to aid student learning. UND Flight Operations, located at the Grand Forks International Airport, supports the flight training component of the School’s aviation programs operating a fleet of more than 140 aircraft and simulators.

Facilities

The state-of-the-art aerospace facilities, built largely with grants from the Federal Aviation Administration, are located on the western edge of campus. The five-building complex houses some of the finest classrooms and specialized laboratories available on any college campus today. Among its many features are advanced flight simulators, cockpit procedure trainers, a high altitude chamber for aerospace physiology training, a unique air traffic control simulation lab, polarimetric Doppler weather radar, the Science Operations Center that remotely operates the UND built remote sensing sensor while it is on board the International Space Station, sophisticated computing labs, and the Arthur C. Anderson Atmospherium — a computerized planetarium and multimedia instructional theater.

The School’s computer facilities have developed into one of the most advanced technical and scientific computer systems in the nation. It has achieved a national reputation for the processing and analysis of digital radar data and cloud physics data collected during research flights. Fully integrated systems with advanced networking provide a wide range of computer support activities for academic, research, government, and industry programs. The facilities are linked by fiber optics to 20,000 square feet of space dedicated to computer studies.

The School operates two atmospheric science field research installations. The Road Weather Field Research Facility, along Interstate 29 south of Grand Forks, is the nation’s only dedicated test bed for monitoring the interaction of pavement surfaces with varying weather conditions to support investigation of new concepts in transportation safety. The Glacial Ridge Atmospheric Observatory is an atmospheric and hydrologic research facility. The long-term goal of the facility is to deploy a highly instrumented monitoring network to better observe and understand atmospheric and hydrologic processes. The School also operates a Cessna Citation II jet for the purpose of atmospheric research.

The School operates a modern flight training facility with a fleet of more than 140 aircraft and simulators including reciprocating and turbine powered airplanes and helicopters. A Canadair Regional Jet (CRJ) ASCENT Full Flight Trainer is also available for those students taking upper division flight courses. Aviation students fly tens of thousands of flight hours each year as an integrated part of their undergraduate aviation degrees. A five-story office building with deli/cafeteria and seven hangars are among the expansive airport facilities. A high-speed fiber optic link provides access to the School’s digital computer systems for dispatching, billing, student records, and weather data. A shuttle bus is available to transport students to and from the campus and flight operations.

The School manages the UND Observatory complex, which is located 10 miles west of Grand Forks and 2 miles southeast of Emerado. The observatory currently includes three remotely-controllable optical telescopes (two 16-inch and one 10-inch aperture, respectively) UND Observatory telescopes support student thesis and non-thesis astrometric, broadband photometric, solar chromospheric imaging, and stellar spectrographic research. The site also includes secure, wireless Internet access and an EarthCam, which is used to monitor observatory activities remotely.

Sophisticated geospatial laboratories are situated within the Space Studies and Earth System Science and Policy departments for carrying out land remote sensing and global change research. The laboratories contain extensive data archives from several satellite and aerial platforms.
A biochemistry laboratory located within the Earth System Science and Policy Department houses equipment such as a gas chromatograph, a fluorometer, stereo microscope or Leica DM R HCS microscope system, etc. to undertake studies on geochemical cycles and their relationship with global change and ecosystem processes.

Degrees and Requirements for Graduation

The Department of Atmospheric Sciences, through the John D. Odegard School of Aerospace Sciences, offers the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy in Atmospheric Sciences. The B.S. degree is conferred upon a student who successfully fulfills the graduation requirements. A student must:

1. Complete the University’s Essential Studies requirements.
2. Earn minimum cumulative and institutional Grade Point Averages of 2.50. (Note: transfer students must not only earn a minimum cumulative GPA of 2.50, but must also earn a minimum institutional GPA of 2.50 for studies completed at the University of North Dakota).
3. Complete the curriculum for the major as outlined in the departmental listings; and
4. Make formal application to the Registrar for the degree sought within four weeks of the beginning of the semester in which the student expects to graduate.

In addition, a student may earn a minor in Atmospheric Sciences. The curriculum for both the major and minor is outlined under the specific departmental listing.

The graduation requirements for the Master of Science and Doctor of Philosophy degrees are outlined in the graduate section of the catalog.

The Department of Aviation, through the John D. Odegard School of Aerospace Sciences, offers the degree of Bachelor of Science in Aeronautics and a Masters degree in Aviation. A Ph.D. in Aerospace Sciences is also offered jointly with the Department of Space Studies. The graduate programs are available online as well as on campus. The undergraduate minor introduces students to the variety of space related projects and issues that will affect their careers and lifestyles in the coming decades. It is rare to find courses at the undergraduate level dealing with such topics as space mission design, life support systems, space commercialization, and space law. The curriculum for this program is outlined under the specific departmental listing. The graduation requirements for the Master of Science and Ph.D. degrees are outlined in the graduate section of the catalog.

The Department of Earth System Science and Policy, through the John D. Odegard School of Aerospace Sciences, offers the degrees of Master of Environmental Management, Master of Science, and Doctor of Philosophy in the field of Earth System Science and Environmental Sustainability. The graduation requirements for the Master of Environmental Management, the Master of Science, and the Doctor of Philosophy degrees are outlined in the graduate section of the catalog.

Other Programs

Cooperative Education and Internships. The School encourages its students to gain practical on-the-job experience in their chosen field prior to graduation. Cooperative Education and Internship experiences allow students to secure salaried, career-related work experiences under the supervision of both a sponsoring employer and the appropriate academic department, while at the same time receiving academic credit.

Weather Modification Pilot Training. This one-of-a-kind cooperative education is offered in conjunction with the North Dakota Atmospheric Resource Board. Classes are offered in ground and air cloud seeding technology taught by nationally respected cloud physicists and meteorologists. Students selected to participate as weather modification pilots for the program must have a Commercial Pilot Certificate with instrument and multi-engine ratings.

Scholarships. An extensive scholarship program is available to recognize and reward high achievers in aviation, atmospheric science, and computer science. These scholarships are donated by numerous private individuals and companies who support the School’s tradition of excellence.

Youth Programs. The Aerospace Camp offers a seven-day summer program to introduce the excitement and challenge of aerospace to 16 and 17 year old prospective aviators.

Student Organizations

Airline Pilots Association Aviation Collegiate Experience Club (ACE). ALPA ACE offers the opportunity for students to engage in aviation issues and meet professionals from the industry. The club aims to educate students using real life scenarios and to have speakers introduce and discuss topics valuable to future pilots.

Alpha Eta Rho (AHP). The Delta Chapter of Alpha Eta Rho, an international aviation fraternity, stresses closer ties between students and the industry through education. The group annually sponsors Parents’ Day, an opportunity for parents to experience the excitement of aviation education.

American Association of Airport Executives (AAAE). Specifically geared towards students majoring in or interested in a career in airport management, this student chapter of AAAE promotes professional development and instills
professional attitudes in students who are studying aviation industry related developments, administration, and operations.

**American Meteorological Society.** The North Dakota chapter of the American Meteorological Society seeks to promote advancement and understanding of meteorology. The organization helps students build valuable network ties and gives them an opportunity to learn more about the careers offered in Atmospheric Sciences.

**Association for Computing Machinery Computer Club.** The AMC Computer Club is a student club for computer science majors. It offers help sessions and allows members to visit and tour companies in the industry.

**Association for Computing Machinery - Women in Computing Computer Club.** The AMC Computer Club - WIC - is a student club for computer majors. It offers help sessions and allows members to visit and tour companies in the industry.

**Atmospheric Science Graduate Student Association (ASGSA).** The purpose of the organization is to provide atmospheric science graduate student feedback to the department atmospheric science graduate committee, unite graduate students throughout the department through organized sponsored events and activities, and provide opportunities for professional growth. Those eligible to join ASGSA are anyone who is a student at the University of North Dakota taking graduate level classes in the atmospheric science department or has an assistantship through the atmospheric science department, e.g., GRA, GTA, or GSA, and has paid the required dues. They meet about three times a semester.

**Aviation Safety Association (ASA).** ASA examines safety and professionalism issues in the aviation industry. The organization brings students together with professionals in the aviation industry for candid discussions on aviation and related matters to become further educated about the concerns in the professional community. ASA is open to students of all disciplines.

**Dakota Space Society (DSS).** The Dakota Space Society is a student organization which was established to educate and enlighten members and non-members about the benefits of space. DSS focuses on promoting space and establishing a relationship with the community of Grand Forks. DSS is open to all students from any field of study in both the undergraduate and graduate areas.

**Experimental Aircraft Association (EAA).** The purpose of this UND student chapter of the Experimental Aircraft Association is to bring together students and members of the community who are interested in recreational aviation, flying, Oshkosh Air Show attendance, building airplanes, the EAA Young Eagles Program, and having fun with flying.

**Flying Team.** The UND Flying Team has won the National Championship title of the National Intercollegiate Flying Association (NIFA) numerous times. Students compete in regional and national events oriented toward increasing aviation safety, piloting skill, and aeronautical knowledge.

**International Pilots Association (IPA).** The purpose of IPA is to ease the transition of international students into the U.S. aviation community. While providing a network of contacts and moral support, the association actively collects facts regarding immigration and visa issues, as well as information on both U.S. and international internships and sponsorships.

**Pilots for Kids.** Pilots for Kids is an international organization founded in 1983 by airline crew members. Focusing on the needs of hospitalized children around December, they also go around and help underprivileged children in need. UND’s Pilots for Kids is the only one in North Dakota. They are a charitable organization with the ability to give tax deductions for people who donate. One hundred percent of the money goes directly to those in need.

**Student Air Traffic Control Association (SATCA).** Students interested in Air Traffic Control get involved with this organization to have a voice in the policies and procedures affecting their program and to provide a forum for hiring information and job opportunities. In addition, the group seeks to further aviation safety, awareness, and education through air traffic control forums and meetings.

**Student Aviation Advisory Council (SAAC).** The nine-members of the Student Aviation Advisory Council are elected by their peers to collectively act as a liaison between students, aviation faculty, and administration. The council is a key player in the implementation of new student-oriented programs.

**Student Aviation Management Association (SAMA).** This student aviation organization promotes professionalism in the aviation industry at the college level, and is open to students from all of the aviation related majors. The group sponsors an annual conference featuring speakers from across the nation as well as aviation alumni. Trips to major aviation destinations are planned each year.

**UND Aerospace R/C.** This student-run organization is dedicated to the advancement of the arts, sciences, and technology of aviation and aerospace. The group stresses increased cooperative interdisciplinary opportunities for students in all disciplines, and is actively involved in radio-controlled aircraft design, construction, and development.

**UND Aerobatic Team.** The UND Aerobatic Team competes within the Collegiate Aerobatic Program of the International Aerobatic Club (IAC). Potential competitors must complete the Introduction to Aerobatics flight course or have equivalent experience prior to competing at their first aerobatic contest. The team members practice on both an individual and team basis with a UND Flight Instructor acting as a Safety Pilot. Once the team attends three competitions throughout the Midwest during each season, the scores are compared against other universities throughout the country.

**UND Helicopter Association (UNDHA).** UNDHA was established to promote helicopter aviation at UND to all who are interested. Through alumni and industry contacts, they give helicopter students and enthusiasts opportunities to further explore the rotor wing community. Students who wish to broaden their connections will be given opportunities nationwide to meet representatives from the industry’s leading names.

**Upsilon Pi Epsilon Honor Society.** The student group is the National Computer Science honorary organization. The mission of UPE is to recognize academic excellence at both the undergraduate and graduate levels in the Computing and Information Disciplines. Members must be junior or senior Computer Science majors. Selection is based on high scholastic achievement and is by invitation only.

**Wilderness Pilots Association (WPA).** WPA was organized for aviation students who have a love of the outdoors, and for those who seek the challenge of conventional (tailwheel) airplanes, seaplanes, and skiplanes. The group promotes air safety as it relates to flying into remote areas.

**Women in Aviation, International (WAI).** This student organization was developed to encourage women who are seeking careers in aviation, however, all students are encouraged to participate. The group provides opportunities for women students to learn more about their chosen profession and to participate in a variety of aviation-related activities.

**Service**

Service to the University, the community and the aerospace industry is a vital part of the School of Aerospace Science’s mission. This commitment is typified by such activities as hosting discipline specific workshops, seminars, and conferences.
College of Arts and Sciences

Debbie Storrs, Dean

History and Organization

The College of Arts and Sciences dates from the founding of the University in 1883, and has had organic continuity from that date, in spite of some temporary changes in name and structure. The “Act for Establishing a Territorial University at Grand Forks” provided for a College of Arts “co-existent with” a College of Letters. In 1901 the name “College of Liberal Arts” was adopted, and retained until 1943, when “College of Science, Literature and Arts” was substituted. The latter name was kept until 1967. The President of the University served in effect as dean of the College until 1901, to be followed by George S. Thomas (1901-1911), Melvin A. Brannon (1911-1914), Vernon P. Squires (1914-1930), William G. Bek (1930-1948), Robert Bonner Witmer (1948-1965), and interim associate dean Philip A. Rognlie (1965-66). Bernard O’Kelly was dean from 1966 until his retirement in 1995 when he was succeeded by John Ettinger (1995-1998), Albert Fivizzani served as interim dean of the College from 1998 until 2001. Martha A. Potvin became dean in 2001 and served until 2011, with Bruce Dearden serving as interim dean from 2004 to 2005. Kathleen A. Tiemann served as interim dean from 2011 to 2013, when Debbie Storrs became dean.

The College includes 18 academic departments: Anthropology, Art and Design, Biology, Chemistry, Communication Sciences and Disorders, Criminal Justice, English Language and Literature, Geography, History, American Indian Studies, Mathematics, Modern and Classical Languages, Music, Philosophy and Religion, Physics and Astrophysics, Psychology, Sociology, and Theatre Arts. The coordinator of the Honors Program, the coordinator and faculty of the Humanities and Integrated Studies Program, and the director of the Interdisciplinary Studies Program are also members of the College’s faculty. The faculty of departments structurally located in other colleges — Computer Science and Economics — are regularly consulted on an associate faculty basis, since the disciplines of those departments are historically associated with the liberal arts. Many of the liberal arts faculty are involved in various ways in the work of the College of Education and Human Development.

The College enrolls all undergraduates who wish to complete studies for the Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music or Bachelor of Science degree with concentration in some substantive or applicative field of study within the traditionally broad spectrum of the liberal arts.

Mission

By its nature and in accordance with its history, the College of Arts and Sciences concerns itself principally with higher education in the broadest or liberal sense. The Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts and Bachelor of Music are therefore the principal first degrees offered by the College; through subsequent enrollment in the School of Graduate Studies, students pursue master’s or doctoral degrees in the liberal arts fields. Many undergraduates in the College are preparing themselves for specific professions—e.g., conservation, writing and editing, scientific research, the performing arts, secondary-school teaching, programming, translation, speech therapy, the justice system and government service. However, the College’s overall goal for all students is intellectual growth through study in the liberal arts: the natural sciences and mathematics, the humanities, the social sciences, and the fine arts. These fields of study concern themselves first with the nature of humanity and of the universe, rather than with specific vocational applications.

The College of Arts and Sciences therefore pursues these goals:

1. To provide programs leading to the B.S. or B.A. in liberal arts disciplines and the B.Mus. or B.F.A. in the Fine Arts;
2. To offer programs leading to career-ready baccalaureates in certain fields which have developed from liberal arts disciplines;
3. To offer, through most of its departments, programs leading to master’s degrees and doctorates;
4. To support scholarly and creative activity in the arts and sciences, so that both undergraduate and graduate students can be exposed to, and take an active part in, the creative and scholarly processes and the advancement of knowledge;
5. To foster in students those abilities which contribute to all learning—skills of communication; habits of independent thought, analysis and judgment; and powers of imagination and creativity;
6. To create an environment in the College, and throughout the University, which fosters the study and understanding of diverse cultures and international communities;
7. To provide the opportunity for all students at the University to take courses in liberal arts disciplines.

Students in the College of Arts and Sciences are prepared on graduation for a wide variety of careers, or to continue their studies in graduate schools, as well as medical or law schools and other professional programs. Whether or not they pursue further study, their liberal education as undergraduates will have helped them become flexible life-long learners, and thus have prepared them for a future characterized by rapid change.

Admission to the College

Freshman students who have decided on a major in Arts and Sciences may be admitted directly to the College. Students enrolled in other colleges at UND who decide on an Arts and Sciences major may transfer to Arts and Sciences provided they are in Academic Good Standing. Transfer students with a satisfactory academic record (generally a C or 2.00 Grade Point Average) may be admitted directly to the College. Please note that some programs, e.g., Communication, Communication Sciences and Disorders, Criminal Justice Studies, Forensic Science, and Political Science have higher grade point average requirements.

Degrees

The only difference between the B.A. and the B.S. is that the latter degree is conferred upon students completing a major or concentration in mathematics or a natural science (biology and related fields, chemistry, forensic science, geography, and physics). In Psychology there are separate requirements for the B.A. and B.S. Students with both science and non-science majors (double majors) may choose either degree.

By following certain specified programs, students may also obtain one of the following special degrees: Bachelor of Fine Arts, Bachelor of Music, B.S. in Chemistry, B.S in Criminal Justice Studies, B.S. in Fisheries and Wildlife Biology, B.S. in Geology, and Bachelor of General Studies (See the appropriate departmental listing.)

Degree Requirements

Basic requirements are the same for all students seeking a degree through the College of Arts and Sciences (except for those in the Four-Year Honors Program). These requirements fall into three main categories.

I. University Graduation Requirements (applicable to all undergraduates).

II. Transfer Credits. No more than 12 credits of transferred technical or vocational credit shall apply to the requirements for the degrees of the College of Arts and Sciences.

III. Language Requirements. Certain programs within the College require proficiency in another language, either two semesters of College level work (Level II) or 4 semesters (Level IV). Students are advised to consult the requirements for a given major under the heading “Required in Other Departments.” Students who are unsure about what their major will be are advised to establish language proficiency as early as possible.

IV. The Major or Concentration. Majors, basically a minimum of 33 credit hours in a single field, are offered in a variety of subjects. The requirements for these may be found in the departmental and interdepartmental listings. Students should note particularly the requirements not only of the majors and concentrations, but, where appropriate, the accompanying requisites in other departments. In the Major (or concentration) students must have a grade point average of at least 2.20 by graduation.
Majors Available in the College

- American Indian Studies
- Anthropology
- Art
- Biology
- Chemistry
- Chinese Studies
- Classical Studies
- Communication
- Communication and Disorders
- Computer Science
- Criminal Justice
- Economics
- English
- Forensic Science
- French
- German
- Graphic Design & New Arts Media
- History
- Interdisciplinary Studies
- International Studies
- Mathematics
- Music
- Music Education
- Music Performance
- Music Therapy
- Norwegian
- Philosophy
- Physics
- Psychology
- Religion
- Social Science
- Sociology
- Spanish
- Theatre Arts
- Women and Gender Studies

Multidisciplinary and Interdisciplinary Studies

Students with interests in Peace Studies, Russian Studies, Scandinavian Studies, Canadian Studies or other fields that are interdisciplinary in nature should consult the faculty in related disciplines as well as the Director of Interdisciplinary Studies.

Minors

A minor is not necessary for a degree from the College, but generally a student may declare a minor in any field in which a major is offered. Some minors, e.g., Intellectual History, Linguistics, and Nonprofit Leadership, are available where there is no major. Where a minor is not specifically listed in the appropriate part of the catalog, a student may declare a minor only with the approval of his adviser, the Dean, and the department or departments concerned. A Grade Point Average (GPA) of 2.00 is required in a minor.

Teacher Licensure Preparation

To prepare to teach in secondary schools, students must meet requirements set by the College of Education and Human Development. In addition, the candidate must have a major or concentration in a "teaching field" as listed in the same section. Students wishing professional licensure should, as soon as possible, seek advisement from, and admission to, the College of Education and Human Development as well as A&S. To be accepted for Student Teaching, applicants must have a 2.75 Grade Point Average (GPA) in their major, a 3.0 or better in all Education coursework, and a 2.75 GPA in all work attempted up to the time of application.

Law School Preparation

The University of North Dakota School of Law, in common with others, strongly recommends as preparation for legal studies the B.A. or B.S. with a broad, liberal education rather than specialized or technical training. For more specific expectations and entrance requirements, students should consult the Bulletin of the School of Law. See also the Law School (p. 627).

Graduate Studies

Most departments in the College offer graduate work leading to the M.A., M.S., M.Mus, M.F.A. or M.Ed., and several have Ph.D. or D.A. programs. Students intending to continue their studies in graduate school should acquaint themselves early with the expectations and admission requirements of the various graduate programs as set out in the Bulletins of this university and other graduate schools.

Pre-Health Professional Programs

Students interested in any of the Pre-Health Professional programs listed below normally enroll in the College of Arts and Sciences (note: Pre-Nursing, Pre-PT and Pre-OT). Information on the College of Arts and Sciences Pre-Health Professional programs is available on UND’s Pre-Health website at http://arts-sciences.und.edu/pre-health. Freshmen students must attend the 3 required advising meetings for freshmen during the fall semester and 1 required advising meeting during the spring semester held by the Health Sciences Advisor - dates, times and location of these meetings are posted on the Announcement/Events link on the website above. Older students may meet individually with the Health Sciences Advisor by appointment only - instructions for setting up appointments are posted on the Advising/Appointments link on the website above.

Pre-Chiropractic

Most chiropractic schools only require a minimum of three years of college; however, because of state licensing requirements, UND encourages students to complete an undergraduate degree - any major is acceptable. Most chiropractic schools require successful completion of courses in basic sciences, social sciences, humanities and English. Some schools require or strongly recommend specific courses. Recommended curricula and a sample schedule for Pre-Chiropractic courses are available in the Pre-Chiro Guide on the UND Pre-Chiropractic Program website at http://arts-sciences.und.edu/pre-health/pre-chiro.cfm. For information on specific chiropractic schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean in the College of Arts and Sciences and the UND Pre-Chiropractic website.

Pre-Dentistry

Most dental schools require a minimum of three years of college; however, the vast majority of admitted students have completed an undergraduate degree - any major is acceptable. All dental schools require successful completion of at least one year each of biology, general chemistry, organic chemistry, physics and English composition; and most require at least one semester of biochemistry, public speaking and art. Many schools require or strongly recommend additional specific courses. Recommended curricula and a sample schedule for Pre-Dentistry courses are available in the Pre-Dent Guide on the UND Pre-Dentistry Program website at http://arts-sciences.und.edu/pre-health/pre-dent.cfm. For information on specific dental schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean in the College of Arts and Sciences and the UND Pre-Dentistry website.

Pre-Medicine

Nearly all medical schools require the completion of an undergraduate degree - any major is acceptable. All medical schools require successful completion of courses in the basic sciences, social/behavioral sciences, math and English.
Many schools require or strongly recommend additional specific courses. Recommended curricula and a sample schedule for Pre-Medicine courses are available in the Pre-Med Guide on the UND Pre-Medicine Program website at http://arts-sciences.und.edu/pre-health/pre-med.cfm. For information on specific medical schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Medicine website.

**Pre-Mortuary Science**

The American Board of Funeral Service Education accredits about 60 mortuary science programs. The majority are two-year associate degree programs. There are some, however, some states (i.e., Minnesota) that require funeral directors to have a bachelor's degree in order to practice within their boundaries. In that case, there are 6 colleges and universities which offer Mortuary Science programs that culminate in a bachelor's degree - the University of Minnesota has such a program. Students may do two years of Pre-Mortuary Science courses at UND before transferring to UM for completion of that bachelor's degree. A recommended curriculum and a sample schedule for the Pre-Mortuary Science courses are available in the Pre-Mort Science Guide on the UND Pre-Mortuary Science website at http://arts-sciences.und.edu/pre-health/pre-mort-sci.cfm. For more information on Pre-Mortuary Science, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Mortuary Science website.

**Pre-Optometry**

Most optometry schools require a minimum of three years of college, however, the vast majority of admitted students have completed an undergraduate degree - any major is acceptable. All optometry schools require successful completion of at least one year of biology, general chemistry, physics and English composition; and most require at least one semester of organic chemistry, biochemistry, anatomy, physiology, microbiology, statistics and calculus. Additional specific courses may required by each school. Recommended curricula and a sample schedule for Pre-Optometry courses are available in the Pre-Opt Guide on the UND Pre-Optometry website at http://arts-sciences.und.edu/pre-health/pre-opt.cfm. For information on specific optometry schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Optometry website.

**Pre-Osteopathic Medicine**

Most osteopathic schools require the completion of an undergraduate degree - any major is acceptable. All osteopathic schools require successful completion of courses in the basic sciences, social/behavioral sciences, math and English. Many schools require or strongly recommend additional specific courses. Recommended curricula and a sample schedule for Pre-Osteopathic Medicine courses are available in the Pre-Osteo Guide on the UND Pre-Osteopathic Medicine Program website at http://arts-sciences.und.edu/pre-health/pre-osteomed.cfm. For information on specific osteopathic schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Osteopathic Medicine website.

**Pre-Pharmacy**

Most students entering pharmacy schools have completed 3 or more years of undergraduate preparation. Most pharmacy schools require successful completion of at least one year each of general chemistry, organic chemistry, physics and English composition; and most require at least one semester of biochemistry, anatomy, physiology, microbiology, statistics and calculus. Additional specific courses may required by each school. Recommended curricula and a sample schedule for Pre-Pharmacy courses are available in the Pre-Pharm Guide on the UND Pre-Pharmacy Program website at http://arts-sciences.und.edu/pre-health/pre-pharm.cfm. For information on specific pharmacy schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Pharmacy website.

**Pre-Physician Assistant**

Most traditional physician assistant programs require an undergraduate degree - any major is acceptable. Most physician assistant programs require successful completion of at least one semester of biology, general chemistry, organic chemistry, biochemistry, anatomy, physiology, microbiology, statistics, psychology and English composition. Additional specific courses may required by each school. Recommended curricula and a sample schedule for Pre-Physician Assistant programs are available in the Pre-PA Guide on the UND Pre-Physician Assistant website at http://arts-sciences.und.edu/pre-health/pre-pre-pa.cfm. For information on specific physician assistant schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Physician Assistant website.

**Pre-Podiatry**

Most podiatry schools prefer or require the completion of an undergraduate degree - any major is acceptable. All podiatry schools require successful completion of at least one year each of biology, general chemistry, organic chemistry, physics and English composition. Many schools require or strongly recommend additional specific courses. Recommended curricula and a sample schedule for Pre-Podiatry courses are available in the Pre-Podiatry Guide on the UND Pre-Podiatry Program website at http://arts-sciences.und.edu/pre-health/pre-pod.cfm. For information on specific podiatry schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Podiatry website.

**Pre-Veterinary Medicine**

Most veterinary schools prefer or require the completion of an undergraduate degree - any major is acceptable. All veterinary schools require successful completion of courses in the basic sciences, advanced biological sciences, social/behavioral sciences, math and English. Some schools require or strongly recommend additional specific courses. Recommended curricula and a sample schedule for Pre-Veterinary courses are available in the Pre-Vet Guide on the UND Pre-Veterinary website at http://arts-sciences.und.edu/pre-health/pre-vet.cfm. For information on specific veterinary schools and their requirements, consult with the Health Sciences Advisor in the Office of the Dean of the College of Arts and Sciences and the UND Pre-Veterinary website.

**Honors and Independent Study**

Students in the College are encouraged to take advantage of the educational opportunities offered by the Four-Year Honors Program and the Senior Departmental Honors Program. In these programs the student bears a greater responsibility for his/her own education than in the more formal programs of the College. Therefore the honor student must develop at once intellectual initiative and intellectual self-discipline; and usually the rewards are correspondingly greater.

Without entering either of the Honors Programs, both of which require better than average academic attainment, students will find within the College many opportunities for independent study and research for which they can receive academic credit. Most departments have "readings" or "special topics" courses in which the student can work with a faculty member in some area not covered by regular courses. Overseas study, especially for Language Majors (several of whom receive scholarships to finance their travel through the Arneberg and Larsen awards each year), is another way in which students can profitably extend the scope of their education. In a variety of circumstances, study or research done off campus can also be offered for academic credit.

Students in the College are also encouraged to plan and to propose to the Dean or to appropriate faculty members interdisciplinary courses which they believe would be educationally sound and interesting. Arts and Sciences is a non-departmental course listing, under which students may earn credit for special "on-demand" courses, seminars, etc. Students or faculty members who wish to propose a special course under this number should consult the Dean’s Office.

Students who have special preparation in the subject matter of a course offered at the university or who because of particular interest bring themselves to proficiency or depth in the subject through private study may, with permission of the department, challenge the course (or courses) for credit by special examination.
College of Business and Public Administration

Steve Light, Interim Dean

History
A course in Commerce was organized in 1917-1918 as a four-year curriculum within the College of Liberal Arts, with students granted the degree of B.A. (Course in Commerce). A School of Commerce was organized in 1924 as an independent two-year school on a distinctly professional basis. The name was changed in 1955 to the College of Business and Public Administration (CoBPA). The College’s undergraduate business programs have been accredited by the AACSB International — the Association to Advance Collegiate Schools of Business — since 1984, and the MBA program has been accredited by AACSB since 1990. The graduate program in Public Administration is independently accredited by NASPAA — the Network of Schools of Public Policy, Affairs, and Administration.

Mission Statement
Learn with Passion, Discover with Purpose, Create Lasting Value, and Transform Lives.

This mission reflects our efforts to expand student learning, improve faculty research and knowledge, strengthen alumni relationships, and become more active stewards in society.

Five-Year Vision
The College of Business and Public Administration will become a leading institution in contributions to intellectual advancement. The CoBPA is building and enhancing its effectiveness in providing career advisement for its graduates. This will be exemplified through a life-cycle approach — initiation through maturation — to career preparation and management for the career professional. The CoBPA will also be known as a leading institution in experiential learning for entry-level career preparation.

Curricula in the College of Business and Public Administration
Courses are offered in the College of Business and Public Administration which lead to the degree of Bachelor of Business Administration with majors in Airport Management, Aviation Management, Banking and Financial Economics, Business Economics, Entrepreneurship, Human Resource Management, Information Systems, Investments, Management, Managerial Finance and Accounting, Marketing, and Operations and Supply Chain Management. The Airport Management and Aviation Management degrees are offered in cooperation with the John D. Odegard School of Aerospace Sciences. Additionally, separate groups of courses lead to the degrees of Bachelor of Accountancy, Bachelor of Science in Public Administration, and Bachelor of Arts in Political Science. Detailed information on all programs may be found in the departmental listings. In order to assist business students preparing for careers in the global economy, the College offers minors in both International Business and Chinese Studies: Culture and Business (see Business Administration (p. 84)). The College also offers minors in Information Systems and Operations and Supply Chain Management. For both business and non-business students, we offer a certificate program in Entrepreneurship (see Entrepreneurship (p. 123)) and Non-profit Leadership. Also available to all students are minor programs in Political Science, Public Administration, Leadership, Nonprofit Leadership, and Sport Business.

The College of Business and Public Administration also offers a major and minor in Economics in cooperation with the College of Arts and Sciences.

The College offers a course that provides an overview of the many areas of focus in business, Introduction to Business (BADM 101). This course provides a study of business and its environment, organization, operation, and the interrelationships with government and society. Students will become familiar with the American enterprise system and issues facing society today. The Introduction to Business course is open to anyone enrolled at the University and will fulfill a portion of the Social Science Essential Studies requirement.

Admission
Students apply for admission to the College of Business and Public Administration through the College’s Office of Academic Advisement, room 127, Gamble Hall.

Students on probation in other colleges on the UND campus will not be admitted into the College of Business and Public Administration.

Business
A student pursuing a degree program in business is admitted to the College as a pre-major student. In order to be admitted to a program leading to the Bachelor of Business Administration or the Bachelor of Accountancy degrees, a student must have:
1. Satisfactorily completed the specified freshman/sophomore Pre-Business courses and completed 60 credit hours.
2. Earned at least a 2.50 overall GPA in all courses taken (2.75 for the major in Management).
3. Earned at least a 2.50 overall UND GPA in all courses taken (2.75 for the major in Management).
4. Completed the six Pre-Business Core courses with a grade of "C" or higher.

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
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<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
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<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
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<td>ECON 202</td>
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</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
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Public Administration
A student pursuing a degree in public administration is admitted to the College under that major. Students are required to maintain at least a 2.50 GPA in courses that apply toward their degree and major.

Political Science
A student pursuing a Bachelor of Arts degree in Political Science is admitted to the College under that major. Students are required to maintain at least a 2.50 GPA in courses that apply toward their degree and major.

Specified Pre-Business Courses
The freshman/sophomore Pre-Business courses, and special Pre-Business course requirements related to certain programs, are set forth below:

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<td>ENGL 110</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<td>MATH 146</td>
<td>Applied Calculus I</td>
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<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td>or SOC 110</td>
<td>or Introduction to Sociology</td>
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<td>or ANTH 171</td>
<td>or Introduction to Cultural Anthropology</td>
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<td>Arts &amp; Humanities Electives</td>
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Sophomore Year

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<td>ECON 201</td>
<td>Principles of Microeconomics</td>
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<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
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<td>ACCT 200</td>
<td>Elements of Accounting I</td>
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</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
</tr>
</tbody>
</table>
Degrees and Requirements for Graduation

The degree of B.B.A., Bachelor of Business Administration; B.Acc., Bachelor of Accountancy; B.S.P.A., Bachelor of Science in Public Administration; and B.A.P.S., Bachelor of Arts in Political Science, is conferred upon a student who successfully completes one of the prescribed courses of study in the College of Business and Public Administration. All candidates for graduation must apply to the Registrar within the first four weeks of the semester in which graduation is planned.

All candidates for degrees offered by the College of Business and Public Administration must complete the University’s Essential Studies Requirement section and complete the curriculum for at least one major in the College.

All candidates for B.B.A. or B.Acc degrees must meet the following additional requirements:

1. Be admitted to a business major offered by the College of Business and Public Administration.
2. Earn a minimum 2.50 GPA (2.75 for the major in Management) in all courses that apply toward the degree.
3. Earn a minimum 2.50 GPA (2.75 for the major in Management) in all UND courses that apply toward the degree.
4. Earn a minimum 2.50 GPA (2.75 for the major in Management) in business administration courses that apply toward the degree and major.
5. Earn a minimum 2.50 GPA (2.75 for the major in Management) in all UND business administration courses that apply toward the degree and major.
6. Complete at least half of the business courses that apply toward the degree and major at the University of North Dakota.

All candidates for the B.S.P.A. and the B.A.P.S. degrees must earn a minimum 2.50 overall UND GPA and 2.50 GPA in courses that apply toward the degree and major.

Programs Beyond the Classroom

Internships

The College of Business and Public Administration, through its internship programs, provides undergraduates with the opportunity to explore the business world while enrolled at the University. Students desiring internships may apply for placement with a business firm that has a planned learning program of work approved by the College. Each major within the College has an internship coordinator.

Cooperative Education

Cooperative Education opportunities are available to qualified BPA students. Cooperative Education allows students to both integrate and combine their courses with practical, professional work experience in their chosen field of study. Cooperative Education experiences allow BPA students to secure salaried, career-related work experiences under the supervision of both a sponsoring employer and the appropriate academic faculty, while at the same time receiving academic credit. Students desiring Cooperative Education positions should contact the cooperative education coordinator in their major field of study.

Graduate Education

Graduate education in the College of Business and Public Administration includes degrees of Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), and Master of science with a major in Applied Economics (M.S.A.E.). The Masters of Business Administration and Applied Economics programs are accredited by the AACSB International: the Association to Advance Collegiate Schools of Business.

Facilities

Gamble Hall, an attractive and well equipped building completed in 1968, is the home for most students and faculty of the College of Business and Public Administration. Teaching is enhanced through the use of modern instructional equipment and technologically modern classrooms, as well as six networked microcomputer laboratories that provide students access to the internet and popular spreadsheet, database, and word processing software, along with a wide variety of specialty software. As an example of the best of today’s learning technology, the Cargill Room on the third floor of Gamble Hall has a versatile design which makes it comparable to a corporate board room. The room has kidney-shaped tables that rotate to facilitate small group discussion, board room atmosphere, or a classroom environment. Equipped with video camera, projection devices, and a computer, this room allows both students and faculty to make professional presentations with ease. This classroom was built with a grant from Cargill Inc. The Lanternman Investment Center offers hands-on training and first-hand exposure to financial concepts such as portfolio construction, risk management, financial engineering, trading strategies, and corporate governance issues. This facility is used by graduate and undergraduate students in all business fields in addition to being used in outreach to the business community and to high school students.

The Page Family Marketing Center features spaces to encourage student involvement in hands-on learning. Remodeled areas include a new reception area, secretarial work space, storage area, and a combined focus group/ conference room. Cameras and microphones make it possible to project focus groups or presentations made in the room to other rooms in Gamble Hall. The technology-equipped conference table comfortably seats 16. Teams of up to five students may work on projects and practice presentations in the student break-out study/meeting room, which is equipped with a computer. A marketing student computer lab is equipped with nine computer
stations featuring dual monitors. Teams of up to four students may comfortably work at each station. The lab is also equipped with a presenter’s station and projection equipment.

In our Accounting area, the EideBaily Accounting Learning Center was updated with new technology in 2012. The projection equipment and presenter’s station is also included. For over 48 years, Louis Kulas and Ludwig Koppenhaver dedicated their time and energy to the department of accountancy at UND. To honor these two great men, an accounting classroom was remodeled and named the Kulas Koppenhaver Memorial Accounting Learning Center. The Kulas and Koppenhaver facility includes computers at each seat with dual monitors. It is also equipped with a presenter’s station and projection equipment.

The Deloitte and Brady Martz Accounting Learning Centers feature updated classrooms with improved instructional design and technology. The new classrooms foster better faculty and student interaction. The classroom renovations allowed the space to be balanced in terms of size; each classroom was tiered and updated with instructional technology and professional furnishings. The exterior of the classrooms was refinished with burnished block and new doors with side windows with etched glass bearing the names of the classroom’s corporate sponsors.

A number of facilities in the College were completed during the summer of 2007. The Gate City Bank room transformed a classroom into the appearance of a Gate City Bank location. The Gate City Bank and Brady Martz rooms include state-of-the-art equipment for teaching students in person and online at the same time (hybrid). Student seating is much improved over the original seating in the room. The tiers in the classrooms have been preserved, retaining the teaching environment. The environment now includes two projectors to aid in displaying two sources of information at one time.

The Ottertail Corporation Suite has provided a remodeled office area for the College. An improved graduate student area has provided enhanced work spaces for students.

The John C. Berg Memorial Accountancy Suite has completely transformed the Accountancy outer office and greatly improved traffic flow through the area. The new area is much improved as compared to the old in providing an inviting environment for students and their families.

For students in the College using these facilities, class projects and exercises will be integrated into a wide variety of classes, providing a depth and breadth of topic coverage not previously possible. Other classrooms in Gamble Hall are designed in amphitheater format to facilitate case study instruction. A study room is available within the building so that students may make profitable use of their time between classes. One classroom serves as an interactive video studio and is among the several sites currently used by the North Dakota Interactive Video Network.

The Bureau of Business and Economic Research

The Bureau of Business and Economic Research (Gamble Hall, Room 290) serves as a coordinating agency for research in the fields of business, economics and government. It initiates research directly or in cooperation with other private or public agencies and publishes the results of such research as well as that accomplished by staff members of the College of Business and Public Administration. The Bureau collects and processes basic data on business activity and serves as a repository of reference data.

The Center for Innovation

The Center for Innovation (Ina Mae Rude Center and Skalicky Center) helps entrepreneurs and small manufacturers launch new products and companies, expand existing operations, bring new products to market, develop business and marketing plans, and manages the Rural Technology Incubator. Over 300 new products and companies have been launched with assistance from the Center.

The Small Business Development Center

The North Dakota Small Business Development Center provides counseling and technical assistance to potential and existing small business owners. It serves as a link between the North Dakota University System and the private sector by providing one-to-one counseling, training and outreach assistance. In partnership with the University System and federal, state, and local agencies, it provides management and technical assistance to existing and aspiring entrepreneurs to promote a stable economy, develop new jobs in the private sector and foster growth of the free enterprise system in North Dakota.

Career Development

The Pancratz Career Development Center provides professional development services for all College of Business & Public Administration students to help them discover and leverage their strengths as they work toward achieving their career goals. Services include resume and cover letter review; assistance with job and internship searching; interview practice; a professional mentor program partnering students with alumni; career fair preparation; LinkedIn profile development, and more. Center staff works with students one-on-one to provide assistance at any point in their career journeys, and early involvement is encouraged. Staff delivers relevant information on professional development topics through workshops and classroom presentations. The center also builds mutually beneficial connections between employers and students to serve the needs of both groups.

BPA Student Council

The College of Business and Public Administration Student Council (BPAC) of the University of North Dakota, founded in 1996, is a student organization representing all departments of the College of Business & Public Administration. The BPAC organization purpose is to coordinate and plan activities involving student organizations and to encourage communication between students, faculty, and the administration and serve in an advisory capacity to the Dean of the College of Business and Public Administration. BPAC consists of four officers and representatives from student organizations within the college.

Student Organizations

Student organizations in the College of Business and Public Administration include the following clubs, associations, and professional affiliations:

- Accounting Club
- Alpha Kappa Psi
- Arnold Air Society
- Association of Information Technology Professionals
- DECA
- Emerging Leaders
- Management Club
- MBA Student Association
- MPA Student Association
- Nonprofit Leadership Student Association (NLSA)
- Operations and Supply Chain Management Club
- Phi Beta Lambda
- Public Affairs Club
- Sport Business Student Association
- Student Advisory Council
- Student Society for Human Resource Management
- Student Managed Investment Fund
- Toastmasters

The Bureau of Governmental Affairs

The Bureau of Governmental Affairs (Gamble Hall, Room 160) is the research and service arm of the Department of Political Science and Public Administration. It conducts research into various problems of state and local government in North Dakota either at the request of government agencies or on its own initiative. The Bureau also conducts workshops, seminars, and other conferences for the purpose of disseminating information to state and local government officials, and undertakes activities such as polling and public and non-profit management consulting. It maintains a research library for faculty and student use in conducting research on governmental problems.
Honor Societies

Student honor societies in the College of Business and Public Administration include:

- Beta Alpha Psi
- Beta Gamma Sigma
- Epsilon Pi Tau
- FMA National Honor Society
- Omicron Delta Epsilon
- Pi Alpha Alphs
- Pi Sigma Alpha
- Sigma Iota Epsilon
College of Education and Human Development

Cindy Juntunen, Dean

Organization of the College

The College of Education and Human Development was formed in 1996 through a merger of the Center for Teaching and Learning with three of the departments from the College for Human Resources Development. The College includes five academic departments: Counseling Psychology and Community Services (which also includes Rehabilitation & Human Services); Educational Foundations and Research; Educational Leadership; Kinesiology and Public Health Education; and Teaching and Learning.

Mission

The College of Education and Human Development has the unique mission within the University of fostering healthy human development and learning across the lifespan, beginning in early childhood. In support of this mission, the College actively embraces human and cultural diversity as an asset and seeks to weave it throughout all of our activities. At both the graduate and undergraduate level, students in EHD develop the skills and self-awareness to become effective professionals and leaders in schools, higher education, human service and wellness organizations. In these roles, graduates of EHD empower individuals, families, groups, organizations, and communities to make healthy decisions and lead full and productive lives. Through these efforts, graduates serve a vital function in recreating and maintaining a healthy economy and enhanced quality of life.

The departments of EHD employ a multi-faceted approach to education, relying on research, teaching and service in the education of students. The continuing development of effective and innovative instruction methods provides excellent service and education to diverse groups of students, including those both on and off the UND campus. The constellation of disciplines within the college emphasizes basic and applied research with implications for individual development and social change. This emphasis is reinforced by the professional service provided by faculty throughout the college, many of whom are involved in service to members of the community in mental health, wellness, and teaching roles. Within all three domains—teaching, research, and service—we attempt to form partnerships with community, state, tribal, and national organizations and government, as well as schools and human service agencies, to provide a more comprehensive effort to foster human development and learning.

History

The disciplines in the College of Education and Human Development have a long history at the University of North Dakota.

The University of North Dakota has offered teacher education programs since its founding in 1883. The preparation of teachers at UND was coordinated by the Normal Department from 1883 to 1900; by the Normal College from 1900 to 1905; by Teachers College from 1905 to 1911; by the School of Education from 1911 to 1953; and by the College of Education until 1972, when programs of that college merged with the New School for Behavioral Studies to form the Center for Teaching and Learning. The present education faculty continue the UND traditions of leadership to the schools, colleges, and communities of North Dakota and the Upper Midwest; of promoting a broader view of education; and of providing teachers, administrators, and other educational personnel with intensive, intellectually challenging, integrated programs of study.

Physical activity has been important to students since the early days of UND, whose history shows interesting differences in the development of programs for men and women. The Department of Physical Education, Exercise Science and Wellness was formed in 1963 from a merger of the women’s department of physical education, founded in 1893, and the men’s department, established by 1906. In addition to developing the physical potential of all participating UND students, programs of the department prepare professional leaders for careers in physical education, exercise science, and public health education, which was renamed Kinesiology and Public Health Education.

Although courses in Counseling were offered by UND faculty as early as 1924, development of a formal program was spurred in the 1950’s by the National Defense Education Act, which sponsored preparation of school guidance counselors. With leadership from the Department of Psychology and the College of Education, the Department of Counseling was established in 1963. As part of the College for Human Resources Development, the Department broadened and deepened its programs, which focus on counseling in a wide variety of settings. In 2004 Rehabilitation and Human Services joined the Counseling department, which was renamed Counseling Psychology and Community Services.

Accreditation

UND’s basic (undergraduate) and advanced (graduate) programs for the preparation and continuing education of teachers and other school professionals are accredited by the National Council for Accreditation of Educator Preparation (CAEP, formerly NCATE) and approved by the state of North Dakota. The Doctoral Program in counseling psychology is accredited by the American Psychological Association.

Degree Programs, Majors, and Minors

Bachelor’s degrees are conferred on students in the College of Education and Human Development who satisfactorily complete the prescribed programs of study in their majors and who satisfy the degree requirements of the University and the College. The following undergraduate degrees are offered by departments of the College.

Kinesiology and Public Health Education

B.S. in Kinesiology
B.S. in Public Health Education

Counseling Psychology and Community Services

B.S. in Rehabilitation and Human Services

Teaching and Learning

B.S.Ed. with major in Early Childhood Education
B.S.Ed. with major in Elementary Education
B.S.Ed. with double major in Elementary/Early Childhood Education
B.S.Ed. with double major in Elementary/Middle Level Education
B.S.Ed. with major in Middle Level Education
B.S.Ed. with major in Science Education (secondary)
B.S.Ed. with major in Social Studies Education (secondary)

Students preparing to teach in the secondary schools may fulfill teacher education requirements by completing the following degree programs and the professional education program in the Department of Teaching and Learning.

B.A. with major in English
B.A. with major in French
B.A. with major in German
B.A. with major in Spanish
B.A. with major in History
B.S. with major in Biology
B.S. with major in Chemistry
B.S. with major in Geology
B.S. with major in Geography
B.S. with major in Mathematics
B.S. with major in Physics

Candidates preparing to teach music, art or physical education in the schools may fulfill requirements to teach grades K through 12 by completing the following degree programs and the professional education program in the Department of Teaching and Learning.

B.S. in Kinesiology
Bachelor of Music Education
B.F.A. with major in Visual Arts

Minors may be taken in a wide variety of fields including athletic coaching, chemical dependency, gerontology, health education, recreation and tourism studies, rehabilitation and human services, literacy education, special education, middle level education, and early childhood education.
The appropriate sequences and experiences for these degree programs and minors are described in the department sections of this catalog appropriate to them.

**Admission Requirements**

Admission to the College of Education and Human Development may occur at the time a student is admitted to the University and has declared a major or pre-major in the college. Students considering a major in one of the departments of the college are encouraged to seek information from the College Office of Advising and Admissions located in room 102 of the Education Building.

All students must satisfy any special program admission requirements established by the department in which the student plans to major or for admission to Teacher Education. Students should contact the chairperson of the department or the College Office of Advising and Admissions for details about policies, procedures, and timelines.

**Admission to Undergraduate Teacher Education**

Formal admission to Teacher Education is required of all students before enrollment in the core courses of each program. Application forms are available on the College of Education and Human Development’s web page under Advising and Admissions. **Applications must be submitted before the deadline.** Late applications will not be considered. Incomplete applications will be returned. Notification of admission decisions takes approximately 30 working/school days.

Admission to Teacher Education is competitive and the numbers admitted each year may be limited due to resources. Admission into a teacher education program requires a cumulative 2.75 GPA and completion of 30 hours that apply to graduation. Other factors that are taken into consideration are:

- Completion of prerequisite courses
- Strength of academic record
- Praxis Core scores – must meet the minimum of 150 Math; 156 Reading; 160 Writing or composite score of 466
- Completion of the following coursework with a minimum cumulative GPA of 3.0:
  - ENGL 110 College Composition I 3
  - ENGL 130 Composition II: Writing for Public Audiences 3
  - COMM 110 Fundamentals of Public Speaking 3
- Proof of active LiveText Account
- Professional Dispositions Report
- Available openings in your anticipated area of study

Factors to consider when making application to the Teacher Education Program:

- Travel to off-campus locations will be required as part of the program at your expense.
- Full-time, daytime attendance will be required at various times of your program.
- Graduation from the program does not guarantee licensure to teach.

In order to student teach, you will be required to submit to a full background check and FBI fingerprint check. Also, each state to which you apply for certification/licensure is likely to require a separate background check. Individual school districts may require background checks before you can be placed for field experiences. Misdemeanor or felony convictions, other than minor traffic offenses, may prevent you from obtaining state teaching certification/licensure, even if you successfully complete the program.

Keys to successful completion of the Teacher Education Program:

- Meeting of all academic requirements.
- Satisfactory performance in field experiences completed prior to student teaching.
- Satisfactory performance of Essential Functions.
- No illegal drug or alcohol use.

- Effective interactions with people.
- No convictions of an offense that would authorize or require the Education Standards and Practices Board to refuse to grant a teaching license.
- Adherence to the UND Code of Student Life, evidence of competence, morality, temperance and kindness on your part.
- Healthy body and mind to perform all the responsibilities associated with teaching.

**Design of the Curriculum of the Teacher Education Program**

**Undergraduate Programs**

Programs for the preparation of educators at UND reflect the tradition of progressive education. The progressive vision includes individualized, developmentally-appropriate, and constructivist curriculum; student-centered learning; interdisciplinary approaches to solving real problems; use of primary resources and direct experiences of learners; commitment to community involvement and to the school as a model of democracy; valuing of diversity; and commitment to humane and holistic understandings of learning, teaching, and evaluation.

Programs are designed to enable development of educators who are committed to life-long learning about many things, but especially about the process of teaching; who are able to take an active role in promoting the learning of students; and who are committed to meeting the educational needs of all of their students in a caring, non-discriminatory and equitable manner. Additionally, we want them to recognize the existing inequities in schools and society and adopt a proactive stance that will challenge such inequities and improve the life chances of all their students. Connections between the experiences of teacher education candidates as learners and their preparation as teachers are nurtured in the programs through such practices as field experiences, structured writing and group learning.

The goals of the basic programs in teacher education are to support the development of educators who are learners, active agents of learners and advocates. These goals are supported by the licensing standards of our state and the guiding principles of our learned societies.

**Graduation and Teacher Licensure Requirements**

All students graduating from the College of Education and Human Development will complete all requirements of the department of the student’s major and all graduation requirements of the University. In addition, the College requires that students earn a minimum GPA of 2.20 in all work taken and, in the case of transfer students, a minimum of 2.20 in all UND work. This minimum GPA requirement is superseded, however, by the higher GPA requirements of some programs.

Candidates who are formally admitted to and complete a teacher education program approved by the state of North Dakota, receive a bachelor’s degree with an overall GPA of at least 2.75; meet or exceed the minimum scores on any licensure exams required by the state; and meet the legal requirements which include a satisfactory criminal background check, are eligible for licensure to teach in North Dakota. Candidates apply to the North Dakota Education Standards and Practices Board for licensure. Application should be initiated prior to graduation. Students interested in teacher licensure in states other than North Dakota should seek information in the College Office of Advising and Admissions.

**Other Requirements of Teacher Education Candidates**

**Continuous assessment**

Candidate progress in teacher education programs is evaluated through regular review of candidates’ work and dispositions. At several points in each program, candidates submit required work to faculty for review. At the end of each program, candidates’ knowledge, skills, and dispositions are assessed through a capstone course, the teacher work sample and student teaching evaluation forms.
**Admission to student teaching**

Student teaching is required in all teacher education programs. Each student teaching placement requires work and planning on the part of the student, the Director of Student Teaching and Field Experiences, the cooperating faculty in the schools, and the faculty from the department of the student’s major. Deadlines for applying for student teaching are established each semester. Check in the College Office of Advising and Admissions for exact dates. Late applicants cannot be guaranteed placement in the preferred semester.

Acceptance for student teaching requires that candidates in all majors including Early Childhood, Elementary Education, Middle Level Education, Composite Science, and Composite Social Studies have a minimum cumulative GPA of 3.0 in Teaching and Learning coursework, satisfactorily complete a field experience, present a minimum overall GPA of 2.75 based on at least 76 credit hours of work, have taken the appropriate Praxis II tests required for teacher licensure in North Dakota, and are recommended by the faculty in their area(s) of student teaching. Elementary Education, Middle Level Education, and Secondary Education majors must complete all coursework in the major before student teaching. Early Childhood Education majors and Early Childhood/Elementary Education double majors who have completed all Early Childhood Education major coursework with the exception of TEAM courses may complete the T&L 487 Student Teaching: Pre-Kindergarten student teaching experience.

Admission to student teaching in a secondary education program requires that the candidate has completed or is enrolled in all courses of the major and the professional education programs, has an overall GPA of at least 2.75, has a minimum GPA of 2.75 in the major coursework completed at the time of application, and is recommended by the Teaching and Learning faculty and the student’s adviser(s).

All candidates will also be required to submit to a full background check and BFI fingerprint check. Opportunities are available to student teach abroad through the Global Student Teaching program.

The College of Education and Human Development also offers undergraduate majors in the following fields:

- Kinesiology
- Public Health Education
- Rehabilitation and Human Services

For information about these academic programs, turn to the appropriate sections in this catalog.

**Graduate studies**

At the graduate level, the College offers advanced programs of preparation for school counselors, counseling psychologists, kinesiology professionals, teachers, school administrators, and other educational personnel for schools and institutions of higher education.

The M.S. with a major in Kinesiology is offered by the faculty in the Department of Kinesiology and Public Health Education. The Department of Counseling Psychology and Community Services offers graduate programs leading to the M.A. with a major in Counseling and to the Ph.D. with a major in Counseling Psychology.

**The Department of Educational Foundations and Research offers:**

- **Masters Degree**
  - Educational Studies

**Doctoral Degree**

- Ph.D., with concentrations in research methods or foundations of education.

**The Department of Educational Leadership offers:**

- **Masters Degrees**
  - M.S. Higher Education
  - M.Ed. (PK-12)

- **Educational Specialist Degree (PK-12)**
College of Engineering and Mines

Hesham El-Rewini, Dean

History and Organization

The University charter, in compliance with the Federal Enabling Act of February 22, 1889, which provided a land grant of 40,000 acres for the School of Mines in harmony with the Constitution of North Dakota, located the School of Mines at Grand Forks and made the School of Mines the Engineering College of the University of North Dakota.

The College of Engineering and Mines (CEM) offers programs in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Environmental Geosciences, Geologic Engineering, Geology, Mechanical Engineering and Petroleum Engineering. All programs are housed in a central campus location with lecture rooms and laboratories in the Collaborative Energy Complex, Harrington Hall, Leonard Hall and Upson I and II.

Mission

The primary mission of CEM is to provide students a broad general education coupled with strong fundamentals that prepare graduates to successfully fill important positions in professional practice in industry and government. Program graduates will have a solid background in technical subjects, i.e., mathematics, science, engineering science and design, the ability to think and work accurately, breadth and clearness of vision, and high ideals and purposes. CEM's further mission is to engage in research and scholarly activity that contributes basic and applied discovery to enhance knowledge and student learning while being of benefit to the state, region and nation.

The College of Engineering and Mines further provides engineering programs of equal quality, via distance education, to industry and individuals through the Distance Engineering Degree Program (DEDP). Continuous and ongoing assessment of student learning in accordance with specific program outcomes, including input from program constituents such as students, alumni, employers and industry advisory groups, provides opportunity to measure success and effect program improvement in meeting the mission of the College of Engineering and Mines. The mission of the College includes engineering programs being accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org/).

Accreditation of Engineering Programs

The Engineering Accreditation Commission of ABET has accredited the following University of North Dakota programs: Chemical Engineering, Civil Engineering, Electrical Engineering, Geologic Engineering, Mechanical Engineering, and Petroleum Engineering. Accreditation identifies professional engineering curricula that provide a solid education upon which to base engineering practice. ABET serves the public through the promotion and advancement of engineering, technology and applied science education.

State Boards of Registration governing the practice of professional engineering allow a student who is completing an accredited engineering curriculum to take the Fundamentals of Engineering (FE) examination. Engineer-In-Training certification is granted only after graduation from an accredited curriculum and passing the FE examination. Graduates who have earned Engineer-In-Training certification may typically complete the professional practice examination after four years of engineering experience acceptable to the state board of registration in the state in which they seek registration as professional engineers.

Degrees

The following baccalaureate degrees are conferred upon engineering students who have successfully completed the prescribed courses of study and who have complied with all the other requirements established by the University, including the Essential Studies Requirements for engineering students as listed later in this section: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Environmental Geosciences, Bachelor of Science in Geology, Bachelor of Science in Geological Engineering, Bachelor of Science in Mechanical Engineering and Bachelor of Science in Petroleum Engineering.

An aerospace option/emphasis is offered through both the Electrical Engineering and the Mechanical Engineering programs. The objective of these programs is to prepare graduates for professional engineering practice while simultaneously preparing licensed pilots with an aerospace background.

Additional options and emphases are available for various degrees (e.g. Petroleum, Energetics or Sustainable Energy Engineering concentrations in Chemical Engineering, Biomedical or Computer Science concentrations in Electrical Engineering). For more information on available options and emphases, please see your advisor, your departmental office, or the Solberg Student Success Center (SSSC) in room 103 of the Collaborative Energy Complex.

Graduate Study

Graduate work, offered by departments in the College of Engineering and Mines, leads to the degrees of Master of Engineering with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering, Petroleum Engineering and Sustainable Energy Engineering; Master of Science with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Geologic Engineering, Geology, Mechanical Engineering, Petroleum Engineering and Sustainable Energy Engineering; and Doctor of Philosophy with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Energy Engineering, Environmental Engineering, Geologic Engineering and Geology, Mechanical Engineering, and Petroleum Engineering. Admission to graduate work in the various departments may be granted to a student upon recommendation of the Dean of the School of Graduate Studies and the chair of the department in which the study will be undertaken. Prospective graduate students should familiarize themselves with the material listed in the School of Graduate Studies section.

Minor in Engineering Sciences

A minor in engineering sciences is available to non-engineering students, and has a requirement of 20 credit hours as detailed below:

Required Courses

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGR 201</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
<td>3</td>
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<tr>
<td>ENGR 202</td>
<td>Dynamics</td>
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<tr>
<td>or ENGR 203</td>
<td>Mechanics of Materials</td>
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Select one of the following: 3

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<td>CE 306</td>
<td>Fluid Mechanics</td>
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<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
<td></td>
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<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
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<tr>
<td>Electives</td>
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<td>8</td>
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</tbody>
</table>

Any regularly offered course at the 200 or higher level with the prefix Engr, CHE, CE, EE, GE, ME or PtE may be used as an elective. Further information is available in the Engineering Dean’s Office.

Admission Policy

Admission to the University and the College of Engineering and Mines

Students planning to receive a baccalaureate degree in engineering must be enrolled in the College of Engineering and Mines. They will be admitted to the University and to the College of Engineering and Mines through the Office of Admissions. Application forms and information regarding enrollment and transferring may be obtained from that office. Students transferring to the College of Engineering and Mines from another college within the University or from another institution must have a Grade Point Average (GPA) of at least 2.0. Students planning to seek a baccalaureate degree in a non-engineering topic simply follow campus admission policies.

In some CEM programs, a student is formally admitted to the professional degree program (PDP) when the student is completing the second year of
study in the major. In these programs, admittance to the PDP is required prior to being allowed to take upper division engineering courses. Student should check with their respective CEM department for more information.

Engineering Degree Program Requirements

Most CEM degree programs require that the following requirements be met in addition to any degree-specific requirements:

1. A minimum grade of C must be earned in each of the following foundation courses:
   - **General Chemistry**
     - CHEM 121 or CHEM 221
     - Calculus I and Calculus II
   - **Calculus**
     - MATH 165
     - MATH 166
   - **Physics**
     - PHYS 251 & PHYS 252
   - **English Composition**
     - ENGL 110
   - **Chemistry**
     - CHEM 121 or CHEM 221

2. A GPA of at least 2.0 must be maintained in all engineering courses taken to date.

Engineering Degree Program Application Procedures and Deadlines

Some degree programs require admission to the Professional Degree Program (PDP) prior to enrolling in upper-level (junior- and senior-level) coursework. Please speak with your academic advisor and/or departmental office for more information on the PDP and any relevant deadlines in your program.

If the number of applications for admission to the PDP exceeds the number of spaces available in a degree program, admission will be on the basis of program criteria that include:

1. the GPA earned in the foundation courses and all other engineering courses completed at the time of application for admission
2. additional admission criteria as specified by each program

Additional students may be admitted to an engineering degree program at other times if positions become available and interim admissions are allowed.

Reapplication Procedure

Non-admission to any degree program may be appealed through the College of Engineering and Mines Program Appeals Committee. Reapplication may be made during the next application session.

Academic and Enrollment Policy

**General**

A minimum 2.0 overall GPA and 2.0 UND GPA in each degree program is required of all students in engineering. If either of these GPAs drop below 2.0, the student is placed on probation for one semester. Upon completion of the probation semester the minimum GPA requirements must be satisfied.

**Dismissal**

Dismissal from the College of Engineering and Mines will result if the conditions of probation are not met. For a student wishing to return to the College of Engineering and Mines following dismissal, an Application for Reinstatement must be submitted to the appropriate department. A denial of reinstatement may be appealed to the College of Engineering and Mines Program Appeals Committee.

**Appeals**

Appeals of the Dean’s decisions, and all appeals regarding admission and reinstatement, are heard by the College’s Program Appeals Committee.

**Graduation Requirement**

A student in Engineering must obtain a 2.0 overall Grade Point Average and a 2.0 GPA for engineering courses required in the College of Engineering and Mines to satisfy graduation requirements for a degree from the College of Engineering and Mines. A student who transfers to the University of North Dakota from another college or university must also attain a 2.0 GPA for at least 30 credit hours of approved coursework taken at the University of North Dakota. Some programs have additional course requirements for transfer students.

**Cooperative Education**

The undergraduate programs offered by the College of Engineering and Mines prepare students for entry-level professional practice. Since career-related work experience is a valuable adjunct to the academic programs, students are encouraged to participate in the cooperative education program offered through Career Services. Students who participate in the cooperative education program are usually placed in para-professional positions in industry or government, gaining valuable working experience while seeing practical applications of the subjects in their academic studies. In addition, students can increase their understanding of career choices available in their professional fields while gaining valuable experience. Students may be able to earn academic credit for their co-op experience.

**General Curriculum in Engineering**

First and Second Years

The first year of the general curriculum permits a student to continue in any engineering degree program with little modification to his/her departmental program. Students who complete the third or the fourth semester of the general curriculum are required to modify their programs from those listed by their department but can, by proper scheduling, complete their degree requirements at the end of eight full semesters. Students who have not decided upon an engineering department should take the course of studies outlined in the general curriculum until they have made a departmental choice, at which time they should obtain departmental counseling on their academic program.

**Course Title Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td></td>
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<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Graphical Communication</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
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<tr>
<td></td>
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<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>&amp; 122L or CHEM 221</td>
<td>or Fundamentals of Chemistry - Concepts and Fundamentals of Chemistry Laboratory</td>
</tr>
<tr>
<td>MATH 221L</td>
<td>Calculus II</td>
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<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Credits</td>
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<tr>
<td>Sophomore Year</td>
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<tr>
<td>First Semester</td>
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<tr>
<td>ENGR 201</td>
<td>Statics</td>
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<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>12</td>
</tr>
</tbody>
</table>
Outlines for all four-year curricula are found in the Courses of Instruction section of the catalog. Students interested in ROTC programs should consult with their department chair and the Department of Military Science on curriculum options.

**Essential Studies Requirements**

The University requires completion of 39 credits of Essential Studies Requirements (see Essential Studies Requirements listing). Students enrolled in all Engineering programs must complete PHIL 250 Ethics in Engineering and Science, or an approved alternative. Most engineering programs require ENGR 460 Engineering Economy. All Engineering students should plan carefully the fulfillment of their university Essential Studies requirements so they are inclusive of these Engineering Program Requirements.

**Combined Degree Program**

To encourage undergraduate engineering students to extend their studies to include a graduate degree, the College of Engineering and Mines has combined programs in Chemical, Civil, Electrical, Geological, Mechanical, and Petroleum Engineering as well as Geology which permit students to earn both B.S. and M.S./M.Engr. degrees concurrently. This program allows students to designate two three-credit hour courses to count for both degrees and additional courses for graduate-only credit while completing the B.S.

- Students may be admitted to the Combined Degree Program after the completion of 95 credit hours towards the B.S. degree with a GPA of at least 3.0, and before completion of the B.S. degree.
- Completed applications must be received at the School of Graduate Studies by the application deadline.

A complete application includes:
- School of Graduate Studies application and application fee
- 3 letters of reference
- Statement of Purpose
- Program of Study - Combined Degree

The two three-credit hour courses designated for both degrees must not have been completed at the time of application and they must have graduate course standing.

- The student is admitted to the School of Graduate Studies on completion of 125 credit hours towards the B.S. degree with a GPA of 3.0 or higher.
- Students in the program may opt to be awarded their B.S. and M.S. degrees sequentially or at the same time.

**Student Organizations**

**Student Societies**

There are student chapters of each of the following professional and technical societies: American Association of Petroleum Geology (AAPG), American Institute of Chemical Engineers (AIChE), American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), American Water Works Association/Water Environment Federation (AWWA/WEF), Association of Engineering Geologists (AEG), Association of Underground Geologists, International Society of Rock Mechanics (ISRM), Institute of Electrical and Electronics Engineers (IEEE), IEEE Computer Society, Society of Exploration Geologists (SEG), Society of Manufacturing Engineers (SME), Society of Women Engineers (SWE) and Society of Petroleum Engineers (SPE).
Office of Extended Learning

Lynette M. Krenelka, Director

History and Mission

An organized program of extension activities was first established at the University of North Dakota in 1910. Dr. Frank L. McVey, then President of the University, provided the initial support of the University of North Dakota providing life-long learning in his inaugural address in the spring of 1910 when he said, “Education neither begins nor ends with the four years of a college course.” To support the mission of life-long learning, the University has been a long-term member of the University Professional & Continuing Education Association, which advances leadership in professional, continuing, and online education by enhancing the ability of higher education institutions to provide high quality continuing and online online education programs by promoting standards of good practice in higher education.

In 1968 UND’s General Extension Division was changed to the Division of Continuing Education. A restructuring in 1998 resulted in Continuing Education becoming a member of the newly formed Division of Student and Outreach Services. An additional re-organization in 2012 changed the name to Office of Extended Learning, and the unit became part of the Vice President for Academic Affairs and Provost.

The mission of the Office of Extended Learning is to

- Expand UND’s presence by supporting programs that utilize Extended Learning’s innovative services.
- Enrich students’ experiences through quality face-to-face, hybrid and online educational offerings accessible to all students.
- Facilitate collaboration by bringing together UND, the local community, the state, the country and the world community focusing on lifelong learning.

The vision is to provide quality education and innovative services to lifelong learners. The Office of Extended Learning attempts to determine the educational and informational needs of the citizens of North Dakota that cannot be provided through the regular on-campus programs. Once determined, the goal is to serve those needs whenever and wherever possible, providing the activity is consistent with the policies and philosophy of the University. This is accomplished through a cooperative and coordinated effort with the various academic departments by utilizing their research capabilities and available instructional resources.

Online & Distance Degree Programs

If you are looking for a degree program that can fit into your busy lifestyle, you can take advantage of the online and distance degree programs available from the University of North Dakota. With a variety of degrees designed for working adults, you can earn your degree without interrupting your career.

UND Online & Distance Education coordinates program offerings with the academic colleges and departments, with programs designed to fit adult learners’ schedules. Courses are semester-based and are offered in the evenings, on weekends, or online anytime. The delivery method varies with each program, but may include Web conferencing, online, and/or at an off-campus site in North Dakota. Undergraduate online/distance degree programs are available in a variety of subject areas including communication, engineering, general studies, nursing, psychology, and social science. Graduate online/distance degree programs are offered in a wide variety of subject areas, and can be found in the graduate section of this catalog.

Online and distance degree programs follow the same admission standards and academic content as the on-campus programs. Students must be admitted to the University, using the regular admission process in order to take distance courses. The content and rigor of the distance courses is the same as is available in on-campus courses.

Additional information can be obtained by calling UND Online & Distance Education: 701.777.3000 or toll-free 1.800.CALL.UND, or by visiting our Website at: http://UND.edu/online.

Online & Enroll-Anytime Courses

Online and enroll-anytime courses are available from many UND departments. A complete list of online and enroll-anytime courses can be found at http://UND.edu/online. All online and enroll-anytime courses are taught by UND faculty and appear on a student’s regular UND transcript.

Online semester-based courses allow students to take classes that may not fit into their schedule, or while they are place-bound for reasons involving work or family. Students looking for the flexibility of taking online classes have many options from which to choose. The online semester-based courses are taught within the regular academic semesters, are eligible for financial aid, charge tuition at the North Dakota resident rate (some exceptions apply), and may be taught either in a “live” synchronous environment with set class meeting times or in an asynchronous environment where students can access course materials at the day and time of their choosing.

Self-paced enroll-anytime courses allow students to enroll at anytime, work at their own pace, and study in a place of their choosing. Students have nine months from their enrollment date to complete a course. Enroll-anytime courses allow the student to learn and grow while managing family and/or work responsibilities. Courses are offered online, but are not eligible for financial aid.

Additional information can be obtained by calling: 701.777.0488 or toll-free 1.800.CALL.UND ext. 5, email to: UND.online@UND.edu, or by visiting our Website at: http://UND.edu/online.

Osher Lifelong Learning Institute (OLLI@UND)

OLLI is UND’s lifelong learning program that offers non-credit courses, special events, lectures and trips for adults 50 years and better. OLLI brings learners together to explore challenging and fascinating topics and in turn, rewards instructors with the opportunity to work with mature and intelligent students drawn from diverse backgrounds and cultures. Their broad range of life experience and independence of thought challenges the instructors and enriches the exchange of ideas.

OLLI@UND is based in Grand Forks with a second site in Bismarck, ND. Learners from all educational and socioeconomic levels and backgrounds are encouraged to enjoy the unique benefits OLLI membership has to offer. Individuals are able to choose from a collection of educational offerings during three semesters a year without the pressure of tests or grades.

OLLI@UND is funded in part by the Bernard Osher Foundation, which was founded in 1977 by Bernard Osher, a respected businessman and community leader in the San Francisco Bay area. The philanthropic organization seeks to improve the quality of life for mature residents through post-secondary student scholarships, as well as art, cultural, and educational grants. The Foundation supports 115 Osher Lifelong Learning Institutes and 113,000 members on university and college campuses in 50 states.

Additional information can be obtained by calling: 701.777.0488 or toll-free 1.800.CALL.UND ext. 5, by writing: Osher Lifelong Learning Institute, University of North Dakota, 3264 Campus Road, Stop 9021, Grand Forks, ND 58202-9021, email to UND.OLLI@email.und.edu (UND.OLLI@email.UND.edu) or by visiting our website at: http://olli.UND.edu.

Personal & Professional Development

Personal & Professional Development provides distance education for non-academic credit and certification programs. Courses are offered to individuals seeking career, professional or personal development. Enrollment is open, allowing students to enroll at any time and complete within a specified time frame. Course completion is flexible and self-paced. Courses are available online or correspondence by mail. Personal & Professional Development is an Eligible Training Provider for Job Service, ND, SD, MN, and MT.

Courses are offered in the following areas: Test Preparation and Review Courses, Business and Professional, Real Estate Pre-Licensure, Dietary Manager and Nutrition, Healthcare and Fitness, Death Investigation, IT and
Software Development, Management and Corporate, Media and Design, and Skilled Trades.

A complete course listing can be found online at http://und.edu/academics/extended-learning/non-credit/. Additional information can be obtained by calling 701.777.0488 or toll-free 1.800.CALL.UND ext. 5, e-mail to: UNDCourses@email.UND.edu, or by mail: UND Personal & Professional Development, Gustafson Hall Room 103, 3264 Campus Rd Stop 9021, Grand Forks, ND 58202-9021.

Professional Development for Educators

Professional Development for Educators (PDE) provides continuing education learning events for practicing PreK-12 professional educators to increase their knowledge and develop new skills. Professional development (PD) credit earned through these events, which include face-to-face, online or blended workshops, seminars, and conferences, can be used toward renewing a general educator license and as evidence of completion of professional development to apply for school district salary lane changes. The appropriate UND academic departments and colleges review and approve all PDE learning events that are awarded PD credit. The credit approved for these opportunities are 900- and 2900-level credits and may not be applied toward a graduate degree and are not considered degree-eligible credit.

Additional information can be obtained by calling 701.777.0488, toll free 1.800.CALL.UND ext. 5, by writing: Professional Development for Educators, University of North Dakota, 3264 Campus Road Stop 9021, Grand Forks, ND 58202-9021, email to: UND.Educators@email.UND.edu or by visiting our website at: http://educators.UND.edu.

Conference Services and Event Planning

Conference Services and Event Planning provides comprehensive event planning and management services to include: pre-event planning, budget development and financial services, website and marketing, presenter arrangements, continuing education credit applications, facility arrangements, secure online registration, on-site registration, on-site coordination, AV equipment, post-event analysis and evaluation. We can also offer any of these individual services to assist you with your event. For more information, visit our website at: http://conferences.UND.edu or email UND.conferences@UND.edu.


School of Medicine and Health Sciences: Biomedical Sciences, Clinical and Translational Science, Medical Lab Science, Occupational Therapy, Physical Therapy, Physician Assistant Studies, Public Health

The Graduate Committee

The Graduate Committee is the executive council of the Graduate Faculty. In this capacity it is advisory to the Dean of the School of Graduate Studies and serves as the School of Graduate Studies Curriculum Committee. The Graduate Committee is responsible for hearing appeals of decisions on student academic matters rendered by the Dean of the School of Graduate Studies. The voting membership of the Graduate Committee consists of thirteen full members of the Graduate Faculty. These thirteen members of the Graduate Committee are elected by those members of the Graduate Faculty from each of thirteen academic areas, with each person elected to serve a three-year term. Non-voting ex officio members of the Graduate Committee include the Dean of the School of Graduate Studies, any Associate Dean(s), and the appointed graduate student member. The graduate student member must be enrolled in the School of Graduate Studies and will serve a one-year term. The membership roster of the Graduate Committee is available from the School of Graduate Studies and is posted on the School of Graduate Studies website.

Assessment

As an institution of higher education, the university is committed to ongoing assessment of student learning at all levels and in all programs. Assessment of student learning is essential in order for the University to improve educational programs and the experiences of students. Students and faculty are encouraged to respond when asked to participate in surveys and other assessment activities. Students are also encouraged to collaborate in the planning and development of assessment activities and to make suggestions for improvements.

Degrees Granted

The degrees conferred for graduate work are the Master of Arts (M.A.), Master of Physician Assistant Studies (M.P.A.S.), Master of Science (M.S.), Master of Education (M.Ed.), Master of Business Administration (M.B.A.), Master of Engineering (M.Eng.), Master of Environmental Management (M.E.M.), Master of Fine Arts (M.F.A.), Master of Music (M.M.), Master of Occupational Therapy (M.O.T.), Master of Public Administration (M.P.A.), Master of Science in Applied Economics (M.S.A.E.), Master of Public Health (M.P.H.), Master of Social Work (M.S.W.), Doctor of Arts (D.A.), Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.) and Doctor of Physical Therapy (D.P.T.). The Specialist Diploma is offered in Educational Leadership.

Research and Scholarship at UND

The faculty at the University of North Dakota are committed to the advancement of knowledge through research and creative scholarship. High quality creative efforts are evidenced by a number of indicators including, but not limited to, publications, presentations, books, performances, exhibitions, and peer reviewed grants and contracts.
In addition to providing stipends and tuition waivers to qualified degree seeking students, the School of Graduate Studies supports research with Summer Research Professorships, which allow faculty to work with their students on research, and Summer Doctoral Fellowships, which allow Ph.D. candidates to spend full time on their research during the summer.

The annual School of Graduate Studies Scholarly Forum features the research or creative scholarship of students and faculty. The Scholarly Forum is the largest single research event on the UND campus. The School of Graduate Studies has limited resources available to support doctoral student conference travel and dissertation research. Detailed information on these and other programs can be found on the School of Graduate Studies website.

The School of Graduate Studies works closely with the Office of the Vice President for Research and Economic Development to provide opportunities for graduate students. The mission of the Office of the Vice President for Research and Economic Development is to serve the broad research community of the University of North Dakota, a community that is instrumental in meeting the strategic aims of the University which are described in the University of North Dakota’s Exceptional UND Plan. The aim is to expand and strengthen the University’s commitment to research, scholarship, and creative activity as a means of sustaining and extending the knowledge base, enriching the teaching and learning environment, and enhancing economic development in the community, region, state, nation, and across the world. The hallmark of a major research university is its ability to link faculty across all of the institution’s disciplines toward the creation of new ideas and the generation of new technologies. The Office of the Vice President for Research and Economic Development, along with the four research administrative units described below, take a variety of steps designed to create and sustain an environment where faculty and students representing varying disciplines can collaborate in the search for solutions to the world’s major problems. To this end, UND research administration develops resources, both human and technical, to enhance research and creative productivity; disseminates information about research and research opportunities; funds research and creative activities by faculty and graduate students; formulates and administers various policies concerning research to ensure that projects conform both to federal and state guidelines and to the intellectual and academic objectives of the University; stimulates private sector relationships leading to commercial development of the products of the university research enterprise; and manages the intellectual property of the University. The following units report directly to the Vice President for Research.

Office of Research Development and Compliance: Research Development and Compliance provides information and assistance on funding sources and guidelines; UND policies on sponsored programs; forms and applications; regulatory policies, such as those for the Institutional Review Board, Animal Use and Care Committee, Institutional Biosafety Committee, and Conflict of Interest; agreements and contracts; and representations and certifications for proposals to Federal programs and copyright and patents. Its roles and responsibilities are to assist faculty/staff in locating potential funding sources; to provide information regarding sponsor requirements and proposal preparation; to conduct administrative reviews of proposals; to assure compliance with University and sponsor regulations concerning conflict of interest, patents, copyrights, research involving animals, research involving human subjects and misconduct in science or creative activities.

Office of Intellectual Property Commercialization and Economic Development: The newly created Intellectual Property Commercialization and Economic Development (IPCED) unit is responsible for protection and commercialization of University research innovations including: aerospace sciences; computer sciences; medicine and health sciences; and engineering and physical sciences. IPCED, having a U.S. Patent and Trademark Office registered personnel, will provide services to draft, file and prosecute patent applications for inventions. IPCED will define and market technology portfolios of inventions to promote new business ventures and build business alliances to accelerate transition of inventions to the marketplace. Services include performing analysis of patentability, value and marketability to identify strategic direction as a licensing, joint venture or spin-off company opportunity. IPCED is also a resource for drafting and negotiating legal agreements, such as confidentiality and licensing agreements, with business partners. In concert with the Center for Innovation, IPCED is seeking funding of entrepreneurial business ventures from corporate, public and private investors and is establishing an integrated vertical process to enhance commercial success.

Grants and Contracts Administration: The mission of Grants & Contracts Administration is to assist faculty and staff with proposal budget preparation, proposal review, award negotiation and financial administration of extramural support according to sponsor regulations. The financial administration of extramural support received by the University for research, service and instructional programs is the responsibility of the Grants and Contracts Administration office. As early as possible in the grant/proposal cycle, a specific grant officer from the Grants & Contracts Administration office staff is assigned to be involved in all aspects of the funding cycle for a particular award, including proposal preparation, award negotiation, monitoring, and reporting. The assignment of a grants officer is made based on the identity of the potential sponsor, i.e., federal, commercial, foundation, and the type of agreement cost reimbursable or fixed price, etc.

Additional Information

For detailed information students should consult the School of Graduate Studies Section of this Catalog or go to the School of Graduate Studies website at: http://graduateschool.und.edu. Address inquiries to the Dean of the School of Graduate Studies, 264 Centennial Drive, Mail Stop 8178, University of North Dakota, Grand Forks, ND 58202; Telephone (701) 777-2784; or 1-800-CALL-UND; or email at: gradschool@mail.und.edu.

Graduate Programs

The School of Graduate Studies offers programs of study leading to the doctoral degree in 26 fields. Fifty-four fields offer work leading to the master’s degree. Many combinations of major and minor or cognate work are available for the degrees mentioned above. Thesis and non-thesis programs are available. Graduate certificate programs are also available in several areas.

For information on graduate courses, prospective students should refer to the departmental statements in other parts of this Catalog. Updates may also be available on the School of Graduate Studies web site. Courses with 500 and 900 series numbers are graduate courses and are normally open only to graduate students. Only courses listed in the School of Graduate Studies section of this catalog carry graduate credit. Courses numbered over 300 in the Undergraduate section of this Catalog may, in certain instances, be included in a cognate area. Exceptions may apply to language courses where lower level courses may be allowed for a cognate.

Graduate Degree Programs

The following graduate degree and certificate programs are offered through the UND School of Graduate Studies. Updates to this list may be found on the UND School of Graduate Studies website.

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<tr>
<th>Program</th>
<th>Degrees Available</th>
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<tr>
<td>Aerospace Sciences</td>
<td>Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Anatomy and Cell Biology</td>
<td>Master of Science (M.S.), Doctor of Philosophy (Ph.D.), M.D./Ph.D. Combined Program</td>
</tr>
<tr>
<td>Art and Design (Visual Arts)</td>
<td>Master of Fine Arts (M.F.A.)</td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>Master of Sciences (M.S.), Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Aviation</td>
<td>Master of Sciences (M.S.)</td>
</tr>
<tr>
<td>Biochemistry and Molecular Biology</td>
<td>Master of Science (M.S.), Doctor of Philosophy (Ph.D.), M.D./Ph.D. Combined Program</td>
</tr>
<tr>
<td>Biology</td>
<td>Master of Sciences (M.S.), Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Business Administration</td>
<td>Master of Business Administration (M.B.A.), Joint M.B.A./J.D. Program</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Master of Sciences (M.S.), B.S./ M.S. Combined Program, Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Communication</td>
<td>Master of Arts (M.A.)</td>
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<tr>
<td>Communication and Public Discourse</td>
<td>Doctor of Philosophy (Ph.D.)</td>
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<td>Communication Sciences and Disorders</td>
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<td>Computer Sciences</td>
<td>Master of Sciences (M.S.), B.S./M.S. Combined Program</td>
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<td>Scientific Computing</td>
<td>Doctor of Philosophy (Ph.D.)</td>
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<td>Major</td>
<td>Degree</td>
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<tr>
<td>Counseling</td>
<td>Master of Arts (M.A.), B.A./M.A. Combined Degree</td>
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<td>Counseling Psychology</td>
<td>Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Criminal Justice</td>
<td>Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Earth System Science and Policy</td>
<td>Master of Science (M.S.), Master of Environmental Management (M.E.M.), Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Economics (Applied Economics)</td>
<td>Master of Science in Applied Economics (M.S.A.E.)</td>
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<tr>
<td>Education</td>
<td>Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Educational Foundations</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.), Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.), Specialist Diploma (Spec.Dip)</td>
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<td>Educational Leadership</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.), Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Teaching and Learning</td>
<td>Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Early Childhood Education</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Elementary Education</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.)</td>
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<td>English Language Learners</td>
<td>Master of Education (M.Ed.)</td>
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<tr>
<td>Education: General Studies</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Higher Education</td>
<td>Master of Science (M.S.), Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Reading Education</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.)</td>
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<tr>
<td>Special Education</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.)</td>
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<tr>
<td>Instructional Design and Technology</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.)</td>
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<tr>
<td>Engineering</td>
<td>Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.), B.S./M.S./B.S./M.Engr. Combined Program, Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.), B.S./M.S./B.S./M.Engr. Combined Program</td>
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<tr>
<td>Electrical Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.), B.S./M.S./B.S./M.Engr. Combined Program</td>
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<tr>
<td>Environmental Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.)</td>
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<tr>
<td>Geological Engineering</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Mechanical Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.), B.S./M.S./B.S./M.Engr. Combined Program</td>
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<tr>
<td>Sustainable Energy Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Engr.)</td>
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<tr>
<td>English Language and Literature</td>
<td>Master of Arts (M.A.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Geography</td>
<td>Master of Science (M.S.), Master of Arts (M.A.)</td>
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<tr>
<td>Geology</td>
<td>Science (M.S.), Master of Arts (M.A.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>History</td>
<td>Science (M.S.), Master of Arts (M.A.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Kinesiology</td>
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<tr>
<td>Linguistics</td>
<td>Master of Arts (M.A.)</td>
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<tr>
<td>Mathematics</td>
<td>Master of Science (M.S.), Master of Education (M.Ed.)</td>
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<tr>
<td>Medical Laboratory Science</td>
<td>Master of Science (M.S.)</td>
</tr>
<tr>
<td>Microbiology and Immunology</td>
<td>Master of Science (M.S.), Doctor of Philosophy (Ph.D.), M.D./Ph.D. Combined Program</td>
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<tr>
<td>Music</td>
<td>Master of Music (M.M.)</td>
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<tr>
<td>Music Education</td>
<td>Doctor of Education (Ph.D.)</td>
</tr>
<tr>
<td>Nursing and Professional Disiplines</td>
<td>Doctor of Nursing Practice (D.N.P.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Doctoral Programs</td>
<td>Doctor of Nursing Practice (D.N.P.), Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Advanced Public Health Nursing</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Adult-Gerontology Nursing (CNS or NP)</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Family Nurse Practitioner</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Nurse Anesthesia</td>
<td>Master of Science (M.S.)</td>
</tr>
<tr>
<td>Psychiatric Mental Health Nursing (CNS or NP)</td>
<td>Master of Science (M.S.)</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>Master of Occupational Therapy (M.O.T.)</td>
</tr>
<tr>
<td>Pharmacology, Physiology, and Therapeutics</td>
<td>Master of Science (M.S.), Doctor of Philosophy (Ph.D.), M.D./Ph.D. Combined Program</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>Doctor of Physical Therapy (D.P.T.)</td>
</tr>
<tr>
<td>Physician Assistant Studies</td>
<td>Master of Physician Assistant Studies (M.P.A.S.)</td>
</tr>
<tr>
<td>Physics and Astrophysics</td>
<td>Master of Science (M.S.), Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Psychology</td>
<td>Doctor of Philosophy (Ph.D.)</td>
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<tr>
<td>Clinical Psychology</td>
<td>Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Forensic Psychology</td>
<td>Master of Science (M.S.), Master of Arts (M.A.)</td>
</tr>
<tr>
<td>General/Experimental Psychology</td>
<td>Master of Arts (M.A.), Doctor of Philosophy (Ph.D.)</td>
</tr>
<tr>
<td>Public Administration</td>
<td>Master of Public Administration (M.P.A.), Joint M.P.A./J.D. Program</td>
</tr>
<tr>
<td>Public Health</td>
<td>Master of Public Health (M.P.H.)</td>
</tr>
<tr>
<td>Social Work</td>
<td>Master of Social Work (M.S.W.)</td>
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<tr>
<td>Sociology</td>
<td>Master of Arts (M.A.)</td>
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<tr>
<td>Space Studies</td>
<td>Master of Science (M.S.)</td>
</tr>
<tr>
<td>Speech-Language Pathology</td>
<td>See Communication Sciences and Disorders</td>
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<tr>
<td>Technology</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Theatre Arts</td>
<td>Master of Arts (M.A.)</td>
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</table>

### Post Master's Certificate Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Certificate</th>
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<tbody>
<tr>
<td>Education</td>
<td>Certificate for Autisum Spectrum Disorders</td>
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<td>Certificate in College Training</td>
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<td>Certificate in ELL Education</td>
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<tr>
<td>Instructional Design and Technology</td>
<td>Certificate in K-12 Technology Integration</td>
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<td></td>
<td>Certificate in eLearning</td>
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<td></td>
<td>Certificate in Corporate Training and Performance</td>
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<tr>
<td>Engineering</td>
<td>Certificate in Environmental Engineering</td>
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<tr>
<td>Geography</td>
<td>Certificate in Geographic Information Science</td>
</tr>
<tr>
<td>Linguistics</td>
<td>Certificate in Community Based Literacy as Applied Linguistics</td>
</tr>
<tr>
<td>Nursing</td>
<td>Certificate in Advanced Public Health Nurse</td>
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<td></td>
<td>Certificate in Family Nurse Practitioner</td>
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<td></td>
<td>Certificate in Nurse Anesthesia</td>
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<tr>
<td>Certificate in Nurse Educator</td>
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<tr>
<td>Certificate in Psychiatric Mental Health Nurse Practitioner</td>
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<tr>
<td>Certificate in Psychiatric Mental Health Clinical Nurse Specialist</td>
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</tbody>
</table>

**Public Administration**

| Certificate in Health Administration |
| Certificate in Public Administration |
| Certificate in Policy Analysis |
| Certificate in Social Entrepreneurship |
School of Law

Kathryn R.L. Rand, Dean and Floyd B. Sperry Professor

History and Mission

The School of Law, established in 1899, is a graduate professional school of the University which awards the Juris Doctor degree. The curriculum is designed for the full-time student and covers a period of three academic years. The School of Law is a member of the Association of American Law Schools and is accredited by the American Bar Association’s Section of Legal Education and Admissions to the Bar.

The curricular mission of the School of Law is to produce well-rounded legal professionals with the necessary skill set to serve as effective, innovative, and ethical leaders. Its distinct character as one of the smaller public law schools in the nation informs the program of legal education, which is designed to produce competent and ethical lawyers with entry-level proficiency and professional self-sufficiency in law school and reflects a broad, active, and collaborative approach to teaching and learning. Its curricular goals are to facilitate each student’s professional and personal development and to promote the highest professional standards, critical thinking, self- and other-awareness, creative problem-solving skills, life-long learning, and a commitment to serving society. The unique identity and special strengths of the UND School of Law inform the content and delivery of the curriculum. The educational environment reflects the value placed on practice readiness in a variety of settings, including solo and small-firm practice; open-mindedness and intellectual receptivity; federal Indian and tribal law; the need to draw upon knowledge from other fields; and the curriculum’s connection to real-world practice. Consistent with our curricular mission and unique identity, the School of Law’s educational objectives cover:

1. foundational knowledge;
2. foundational skills;
3. ethics and professionalism;
4. leadership, collaborative, and adaptive skills; and
5. service to society.

Graduates are entitled to admission to the bar in the jurisdiction of their choice upon successful completion of that jurisdiction’s bar examination.

Pre-Law Studies

There is no prescribed pre-law curriculum. The law school student body typically includes representatives of nearly every undergraduate field of study. The faculty of the School of Law strongly recommends a broad and liberal undergraduate program which combines rigorous and creative thinking, careful and thorough analysis and substantial oral and written communication opportunities. The major should be a subject area which interests and stimulates the student.

Admission

Applicants for admission to the School of Law must be candidates for or have received a bachelor’s degree from an accredited college or university and must have taken the Law School Admission Test. Admission is competitive. Applicants accepted for the 2015-2016 entering class had a median undergraduate Grade Point Average (GPA) of 3.20 and a median LSAT score of 148.

The School of Law has a rolling admissions policy; although the deadline for application and all supporting documentation is April 1 of the spring preceding entry, if the applicant’s file is completed before the deadline, it will be sent to the Admission Committee for consideration. Applications will be accepted after the April 1 deadline, but will be reviewed in the context of the number of students already admitted. Applicants are strongly urged to complete their applications well before the April 1 deadline, and as early as the preceding fall.

Because a diverse student body provides the best medium for education, the School of Law encourages applications from all regions and all economic backgrounds, as well as from women and members of racial, ethnic, and religious minorities.
School of Medicine and Health Sciences

Joshua Wynne, M.D., M.B.A., M.P.H.
Vice President for Health Affairs and Dean

History and Purpose

The School of Medicine and Health Sciences consists of medical, biomedical research and other health-related academic components that work together to address our purpose of educating and preparing North Dakota residents as physicians, medical scientists and other health professionals for service to the people of this region and the nation, and to advance medical and biomedical knowledge through research. These components include:

1. A statewide, four-year curriculum for medical students leading to the M.D. degree.
2. Postgraduate medical education (residency) programs of three to five years in duration leading to eligibility for board certification in family medicine, internal medicine, general surgery and psychiatry; a one-year transitional program is also offered.
3. A continuing medical education program to address the career-long need of physicians and other health care personnel for continued learning.
4. Graduate programs in the Department of Biomedical Sciences and Department of Pathology leading to the M.S. degree, Ph.D. degree and the combined M.D./Ph.D.
5. Postdoctoral research training opportunities in the laboratories of faculty principal investigators in multiple departments.
6. Graduate program leading to a doctoral degree in physical therapy.
7. Graduate programs leading to master’s degrees in medical laboratory science, occupational therapy, physician assistant studies and public health.
8. Undergraduate programs leading to the following degrees: B.S. in athletic training; B.S. in medical laboratory science.
9. Undergraduate coursework in anatomy, biochemistry, microbiology, immunology, pharmacology and physiology.

Each program noted above is fully accredited by its accreditation agency.

The School of Medicine was established in 1905 and offered, until 1973, the first two years of medical education. Students transferred to other medical schools for the last two years of medical education to earn the M.D. (Doctor of Medicine) degree. During that time, the School established a strong reputation across the nation for the quality and professional attitude of its students, who were welcomed enthusiastically by other medical schools. In 1973, state legislative action approved a four-year curriculum and authorized the granting of the M.D. degree. This was accomplished in stages using a 2:1:1 plan by which students transferred to medical schools in Minnesota for their third year and returned to North Dakota to complete their final year before receiving the M.D. degree. In 1981 the third year was established in North Dakota, providing for a complete in-state medical education program.

The School also established a strong reputation during its early years, which continues today, for the quality of education and research in numerous scientific fields. The institution is nationally and internationally respected for its research in neurodegenerative disorders such as Parkinson’s and Alzheimer’s; cancer; epigenetics; infectious disease; aging; preventive medicine; drug addiction; alcoholism in women; rural health, and eating disorders.

The Physician Assistant Program, established as a certificate program in 1970, is administered by the Department of Physician Assistant Studies. In 2003, the Master of Physician Assistant Studies (MPAS) degree was initiated. In 1949, the medical technology program was initiated with a B.S. curriculum, adding an M.S. degree program in 1978. Medical technology is now known as medical laboratory science, and the programs are administered by the Department of Medical Laboratory Science. The occupational therapy program was initiated in 1956 as a part of the medical school. After being administratively located in the College of Human Development for a number of years, the department moved back into the medical school in 1995. The Master of Occupational Therapy (MOT) degree program was initiated in 2002. The physical therapy program was initiated in 1968, and the master’s degree in physical therapy was added in 1991. The doctoral program in physical therapy was initiated in 2002. The B.S. in Athletic Training degree was approved in September 1990 by the North Dakota Board of Higher Education and is administered by the Department of Sports Medicine. The Master of Public Health program was added in 2012.

In 1996, the name of the School of Medicine was changed to the School of Medicine and Health Sciences to reflect the importance of all components of the school in addressing its purpose. Departments included are biomedical sciences; family and community medicine; geriatrics; internal medicine; medical laboratory science; neurology; obstetrics and gynecology; occupational therapy; pathology; pediatrics; physical therapy; physician assistant studies; psychiatry and behavioral science; population health; radiology; sports medicine; and surgery. The statewide educational program of the school is coordinated through clinical campuses based at Bismarck, Fargo, Minot and Grand Forks.

Suggested Undergraduate Courses for Students Planning to Study Medicine

Four years of college preparation are recommended for students wishing to enter the medical education program of the University of North Dakota School of Medicine and Health Sciences, although a degree is not a requirement. The student is free to select a major in any area of interest, but coursework must include the following mandatory credits:

<table>
<thead>
<tr>
<th>Minimum Semester Hours</th>
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<tbody>
<tr>
<td>Chemistry, including laboratory</td>
</tr>
<tr>
<td>Inorganic and Qualitative</td>
</tr>
<tr>
<td>Organic</td>
</tr>
<tr>
<td>Biology, including laboratory</td>
</tr>
<tr>
<td>Physics, including laboratory</td>
</tr>
<tr>
<td>Psychology/Sociology</td>
</tr>
<tr>
<td>Language Arts (English, Speech, etc.)</td>
</tr>
<tr>
<td>College Algebra or higher math</td>
</tr>
</tbody>
</table>

* A student may substitute a semester or quarter of biochemistry for the final semester/quarter of organic chemistry.

The University of North Dakota School of Medicine and Health Sciences recommends that students take elective courses that include subjects of liberal arts value such as humanities, economics, geography, history and philosophy so that the student’s educational experience will be broad and well-rounded. Computer literacy also is highly recommended. Students are urged to see their advisers regularly.

Application for admission to the School of Medicine and Health Sciences is made through the American Medical College Application Service (AMCAS). The deadline for the AMCAS application is October 15 with the expectation that the remainder of the application will be completed by November 1.

Undergraduate Programs

The following undergraduate degree programs in health sciences are administered by the School of Medicine and Health Sciences. See also the departmental listings.

Athletic Training

Students can pursue a Bachelor of Science degree in Athletic Training through the Department of Sports Medicine. This four-year degree is designed to prepare entry-level athletic training professionals. The academic program is accredited by CAATE. Graduates are eligible to take the national certification test administered by the Board of Certification, Inc. Successful completion of this test allows the graduate to be called a “certified athletic trainer.” Application information and requirements are available from the Department of Sports Medicine.

Medical Laboratory Science (MLS)

The Department of Medical Laboratory Science offers a four-year academic program leading to the degree of Bachelor of Science in Medical Laboratory Science (formerly clinical laboratory science). The degree includes two years of pre-medical laboratory science education followed by two years of
professional coursework. Students who have previously earned a B.S or B.A. degree may earn an additional degree in medical laboratory science by completing a 4 + 1 curriculum option. Students may take much of the professional curriculum online through distance learning. Advancement from pre-medical laboratory science to the medical laboratory professional curriculum is based on a competitive application process. Application for advancement to the professional education component can be found online at http://www.med.und.edu/mls. The MLS program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Graduates of the program will be eligible to sit for a national board certification examination.

Medical Laboratory Science Categorical Certificate

The Department of Medical Laboratory Science offers an MLS Categorical Training Certificate which provides advanced skills to baccalaureate-prepared students to become eligible to work in a highly complex clinical laboratory and meet the requirements to take a national certification examination in a specific categorical area. The requirements for entrance include a baccalaureate degree from an accredited college or university and completion of 20 semester hours in biology, chemistry and/or medical sciences (in addition to or part of the baccalaureate degree). The categorical certificate program includes four “category” choices: Immunohematology, Clinical Chemistry/Urinalysis, Microbiology, or Hematology/Hemostasis. The curriculum consists of both lecture courses delivered over the Internet and laboratory experience-based courses. All coursework, whether lecture courses over the Internet or laboratory experience-based courses, are located at a clinical affiliation site. The Histotechnician Certificate Program is accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS).

Graduate Programs

Ph.D., M.S. and joint M.D./Ph.D. programs are offered in biomedical sciences (Department of Biomedical Sciences) and clinical and translational sciences (Department of Pathology). Professional graduate programs are offered in occupational therapy, physical therapy, physician assistant studies, medical laboratory science, and public health. All of these programs are described in the School of Graduate Studies section of this catalog.

Medical Laboratory Science

The Department of Medical Laboratory Science offers a Master of Science degree program in Medical Laboratory Science. The degree is a non-thesis option that is offered primarily through online distance learning. It provides a broad medical science background as well as experiences in quality management and laboratory finance. The curriculum is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors or laboratory educators. For additional information, visit www.med.und.edu/mls.

Occupational Therapy

The Department of Occupational Therapy offers a five-year, entry-level Master of Occupational Therapy (MOT) degree. Occupational therapy as a profession is based on the belief that purposeful activity (occupation), including its interpersonal and environmental components, may be used to prevent and mediate dysfunction and elicit maximum adaptation. For information regarding the program, visit our website at: http://www.ot.und.edu

The Occupational Therapy program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 4720 Montgomery Lane, Suite 200, Bethesda MD 20814-3449. ACOTE’s telephone number c/o AOTA is (301) 652-AOTA and its web address is www.acoteonline.org (http://www.acoteonline.org). All basic professional programs must comply with the Standards for an Accredited Educational Program for the Occupational Therapist, 2011. Graduates of the program will be able to sit for the national entry-level certification examination for the occupational therapist, administered by the National Board for Certification in Occupational Therapy, Inc. (NBCOT, 800 South Frederick Avenue, Suite 200, Gaithersburg, MD 20877-4150; phone 301-990-7979). After successful completion of this examination, the graduate will be an Occupational Therapist Registered (OTR). Most states require licensure in order to practice; state licenses may be based on the results of the NBCOT certification examination.

A satellite professional-level MOT program, also accredited by ACOTE, is available at Casper College, Casper, WY. Tuition and other information regarding the program are available by contacting the Occupational Therapy Department at Casper College, Casper, WY; telephone 307-268-2613.

Physical Therapy

The physical therapy curriculum is accredited by the Commission on Accreditation of Physical Therapy Education (CAPTE). The six-and-one-half-year program leads to the degree of Doctor of Physical Therapy.

Students eligible to apply for the professional program must complete an application through PTCAS, http://www.ptcas.org/home.aspx, and submit a UND School of Graduate Studies, http://graduateschool.und.edu/my-gradspace.cfm, application form. Applications are available online starting in July through December 15.

Physician Assistant Program

The Department of Physician Assistant Studies offers a Master of Physician Assistant Studies. This 24-month graduate program is accredited by the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA). Admission is determined on the basis of defined health care experience and coursework requirements. A minimum of a baccalaureate degree is required. Graduates are eligible to take the national certification test administered by the National Commission on Certification of Physician Assistants, Inc. (NCCPA). For additional information, or to begin the application process, go to our website at: http://www.med.und.edu/physician-assistant/index.cfm.

Public Health

Established in 2012, the Master of Public Health (MPH) program offers a 42-credit, accredited degree, which can be earned through full or part-time study. The educational priority of the MPH program is preparing students to respond to the growing demand for public health professionals who can transform data into information for decision-making. The size of health data is growing exponentially, and the skills to ‘mine’ big data are exceptionally valued by public and private health agencies, as well as healthcare provider and payer organizations. Therefore, both MPH specializations – Population Health Analytics and Health Management & Policy – emphasize analytics. Special features include an emphasis on faculty-student research collaboration; application of system dynamics to public health; and opportunities for experiential learning with UND’s nationally recognized wellness initiatives and Grand Forks’ many public and private organizations working collaboratively to improve health in the community. Residents of states in the Western Interstate Commission for Higher Education (WICHE) Region receive in-state tuition, and the program is designated as STEM. The MPH program was accredited by the Council on Education for Public Health (CEPH) in 2016. Admissions and program information can be found at: http://www.med.und.edu/master-of-public-health/.

Other Activities

Laboratory Education from North Dakota

Laboratory Education from North Dakota (LEND), a program in the Department of Medical Laboratory Science, provides distance learning opportunities for laboratory professionals to earn continuing education units (CEUs). The Internet is used to deliver the courses and programs, with presentations and case studies available 24 hours a day, 7 days a week.

Indians Into Medicine (INMED) Program

The INMED Program was adopted in 1973 to serve American Indians who are enrolled members of federally recognized tribes. Through a comprehensive recruitment program, INMED seeks to identify and encourage students with
an aptitude for and an interest in health careers. This recruitment begins as early as the middle school level. The program is committed to preparing professionals in all related health care fields. Each year the School of Medicine and Health Sciences allocates places in its first-year medical, physical therapy and occupational therapy classes to qualified American Indian students.

Facilities

The School of Medicine and Health Sciences has facilities in Grand Forks (the administrative center of the school), Bismarck, Fargo and Minot. These regional campuses include family medicine centers (in Bismarck and Minot), library facilities, campus offices and a branch of the Center for Rural Health (in Minot). Affiliations with private and public hospitals in the regional campus cities, but also in less populated cities throughout the state, provide the clinical base for the study of medicine and the other health sciences. In Grand Forks, the new School of Medicine and Health Sciences building is located to the north of the old St. Michael’s hospital, which served as the medical school for many years. The new building was fully occupied in 2016 and houses all biomedical, clinical and health science departments, the Health Sciences Library, modern research laboratories, classrooms, small group rooms, conference rooms and offices. At the heart of the educational space is the simulation center with multiple simulated hospital and clinic rooms, a skills lab and a simulated surgical suite. Students study and work in the simulation center to improve their clinical reasoning and teamwork skills. A state-of-the-art human anatomy laboratory is located on the fourth floor of the modern research wing. Large, open collaborative spaces are present throughout the building. A key design feature of the building is the eight learning communities designed to foster interprofessional collaboration among students from the diversity of disciplines represented by the school’s educational programs. The School of Medicine and Health Sciences campus in Grand Forks also includes the Biomedical Research Facility, an ultra-modern animal facility completed in 2000 and the Neuroscience Research Facility opened in 2004, which houses laboratories for research investigations into neurodegenerative diseases, such as Parkinson’s and Alzheimer’s, as well as drug addiction. In Minot, the UND Center for Family Medicine moved into a new building in the northwest area of the city in 2005; it also houses the Northwest Campus office and a branch of the Center for Rural Health. In Bismarck, the UND Center for Family Medicine moved into a new building in 2012; it also houses the southwest campus office.
College of Nursing and Professional Disciplines

Gayle Roux, Dean

Mission, Vision, Values and Goals

The mission of the College of Nursing & Professional Disciplines (CNPD) is to prepare future leaders, to advance human well-being and improve quality of life for diverse populations, with an emphasis on rural communities in North Dakota, the region and beyond, through the provision of high-quality innovative inter-professional education, research and service.

CNPD Vision Statement:

CNPD will lead the state and nation, and influence the world through the impact of our research, educational programs and practice innovations on health and human services.

Core Values:

The College of Nursing & Professional Disciplines believes in empowerment of students, individuals, and communities. Scholarly investigation, practice, and service are the foundations of our professions. We have a commitment to excellence through creative partnerships, and are accountable to the people we serve. We value:

• Diversity
• Community Engagement and Empowerment
• Discovery and Scholarship
• Professionalism
• Excellence

Goals:

1. Facilitate collaboration and expand UND’s presence by conducting meaningful scholarly activity that impacts the health and well-being of individuals and communities in the state of North Dakota, regionally, nationally and globally.
2. Empower communities and enhance quality of life through exceptional service efforts facilitated by faculty, staff, students, and alumni.
3. Encourage gathering of students, faculty, staff, and alumni in ways that build a meaningful sense of connection with and belonging to the College, its departments, and UND.
4. Enrich the student experience in ways that prepare culturally and environmentally responsive students to be ethical global citizens and leaders, to think critically, to translate evidence into practice, and to maintain a commitment to lifelong learning through inter-professional inquiry, education and service.

The College of Nursing & Professional Disciplines offers professional programs with a foundation in the liberal arts leading to undergraduate and graduate degrees in nursing, community nutrition, dietetics and social work.

Accreditation

The graduate and undergraduate nursing programs are approved by the North Dakota Board of Nursing and accredited by the Commission on Collegiate Nursing Education. The nurse anesthesia program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs.

The Coordinated Program in Dietetics is accredited by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics.

The undergraduate and graduate programs in Social Work are accredited by Council on Social Work Education’s Commission on Accreditation.

Degrees and Requirements for Graduation

The College of Nursing and Professional Disciplines offers the following degrees to students who successfully complete the prescribed course of study and who fulfill the degree requirements of the University:

• Bachelor of Science in Nursing (B.S.N.)
• Bachelor of Science in Dietetics (B.S.D.)
• Bachelor of Science in Community Nutrition (B.S.C.N.)
• Bachelor of Science in Social Work (B.S.S.W.)
• Master of Science (M.S.) with a major in Nursing (5 specialties available)
• Master of Science (M.S.) in Nutrition
• Master of Social Work (M.S.W.)
• Doctor of Philosophy (Ph.D.) in Nursing
• Doctor of Nursing Practice (DNP)

All programs within the College of Nursing & Professional Disciplines have minimum grade point averages that must be maintained.

Licensing

Professional programs of nursing, social work and nutrition are accountable to the public through licensure and registration processes. Many professional licensing boards may not grant licensure to practice if one has been convicted of a felony, and in some cases, a misdemeanor. Those with questions related to licensure are encouraged to consult with the regulatory board in the appropriate state prior to applying for admission to a program. Additionally, many field work and clinical facilities are currently requiring proof of immunizations, drug testing, fingerprints, and/or criminal background checks. Students are responsible for any associated costs.

Nursing

Graduates of the baccalaureate nursing program are prepared in all areas of basic clinical nursing practice, have a solid foundation for graduate school, and are eligible to sit for the national licensing examination for registered nurses (NCLEX-RN). The College of Nursing & Professional Disciplines offers the baccalaureate nursing degree through a traditional on-campus option, an accelerated on-campus option, and a distance delivered RN-BSN option.

Graduate tracks within the masters program in nursing include: Nurse Anesthesia, Psychiatric Mental Health Nurse Practitioner, Adult Gerontology Primary Care Nurse Practitioner, Family Nurse Practitioner and Nurse Educator. The Ph.D. in Nursing program prepares nurses for research and faculty roles with a research emphasis on care of vulnerable and diverse populations. The DNP program prepares graduates who are clinical leaders with expertise in quality improvement and health policy.

Undergraduate Nursing

The College of Nursing and Professional Disciplines offers undergraduate coursework leading to a Bachelor of Science degree in nursing:

• On campus BSN
• Accelerated BSN (limited to students with previous bachelor’s degree)
  Currently not accepting new applications.
• RN-BSN (limited to licensed RNs)

Students who wish to pursue an undergraduate degree in nursing should apply to the University of North Dakota and declare a pre-nursing major in the CNPD. Once a pre-nursing major has been declared, an Office of Student Services advisor will be assigned. Students must complete a formal application and be approved for admission by the Undergraduate Nursing program before enrolling in the nursing curriculum. All potential applicants to the undergraduate nursing major are advised to be aware of admission and curriculum requirements in the Bachelor of Science in nursing program. See CNPD website, undergraduate nursing program, for specific requirements regarding admission and progression. All qualified applicants, are considered based on established admission criteria. The CNPD Undergraduate Nursing Program strives to reflect current evidence based practice in the nursing profession, therefore curricula is subject to change.
Graduate Nursing

The College of Nursing & Professional Disciplines offers graduate coursework leading to a Master of Science degree with a major in nursing in several specialty areas:

- Nurse Anesthesia
- Family Nurse Practitioner
- Adult-Gerontological Primary Care Nurse Practitioner
- Psychiatric-Mental Health Nurse Practitioner
- Nursing Education

Both terminal degrees in nursing are offered, the Doctor of Philosophy in Nursing and the Doctor of Nursing Practice.

Students interested in graduate study should consult the School of Graduate Studies section of this catalog for further information and visit the CNPD website, graduate nursing for specific track requirements for admission and progression. All qualified applicants are considered based on established admission criteria. The CNPD Graduate Nursing Program strives to reflect current evidence based practice in the nursing profession, therefore curricula is subject to change.

Nutrition and Dietetics

Coordinated Program in Dietetics

The baccalaureate program in dietetics, offered as a coordinated program, combines academic preparation with supervised practice experiences for students who wish to become registered dietitian nutritionists (RDN). Upon completion of this degree, graduates are eligible to take the examination for professional registration. The major in community nutrition is designed to enable students to develop a thorough understanding of nutrition and the ability to communicate those principles to the public. Graduates are prepared to work cooperatively with other professionals in improving the overall health of individuals and communities.

Admission to the professional phase of the Coordinated Program in Dietetics

Application to the professional component of dietetics occurs annually in the spring semester for admission in the following fall semester. The application deadline is February 15. If that date lands on a weekend the due date is the next business day.

To be eligible for consideration, the student must complete an application and submit it with a letter outlining professional goals and describing personal qualities that would assist in attaining these goals. Each candidate requests references from two individuals and completes personal interviews. After all applicants have completed the steps in the admission procedure, the selection committee determines the members of the class entering in the fall. The number of students admitted is determined by the availability of faculty and clinical facilities.

Admission of transfer students to the Coordinated Program in Dietetics

Transfer students seeking admission to the professional phase of dietetics must fulfill the same prerequisite requirements as students who complete the preprofessional courses at the University of North Dakota. Students planning to transfer from another accredited institution to UND are advised to contact the Department of Nutrition and Dietetics to verify equivalency of courses on other campuses with those offered at UND prior to applying for admission. All qualified students, whether currently enrolled at or planning to transfer to UND, are considered on merit.

Progression requirements

Students in the professional component of the Coordinated Program in Dietetics will be placed on probation if performance evaluations are unsatisfactory, if the grade point average drops below 2.6, or if a grade of less than a ‘C’ is earned in any course. Dietetic program faculty will meet with the student to discuss the probationary status and develop plans to correct the deficiency. All deficiencies must be removed before advancing to the next semester of the program. If deficiencies remain more than one year, the student must complete a re-acceptance application. Re-acceptance into the program will be on the basis of space available.

Additional expenses

The professional phase of the program has additional expenses due to supervised practice experiences, travel, and professional activities. Additionally, the schedule of classes and supervised practice experiences must have precedence in planning other time commitments, thus limiting employment opportunities. Definite plans for financing the costs of the two years of the professional phase should be arranged prior to application. An estimate of expenses is available from the Department of Nutrition and Dietetics. Financial aid and scholarships are available from various sources. The UND Financial Aid Office can assist in determining which resources are available to individual students.

Community Nutrition

The community nutrition curriculum is designed to allow students to develop an in-depth understanding of nutrition based on the biological and social sciences; the ability to communicate nutrition principles effectively and accurately to the public; and the ability to participate as a team member with other community and health care professionals. Through coursework and supervised practice experience, graduates will become skilled in conducting community nutrition assessments, identifying problems, developing and conducting effective interventions, and collaborating with other professionals to improve the overall health of individuals and communities. A Community Nutrition graduate is eligible to become a licensed nutritionist (L.N.) in the state of North Dakota.

Graduation requirements

The student must earn a grade of “C” or better in all nutrition, foods, and science courses taken to fulfill requirements of the community nutrition major and must attain an overall grade point average of at least 2.2.

Minor in Nutrition

Students in other majors may elect to earn a minor in nutrition. The requirements of the minor are the completion of 20 semester hours of credit in nutrition-related courses. To develop the program of study, students must consult an adviser in the Department of Nutrition and Dietetics.

Master of Science in Nutrition with Specialization in Nutrition Education and Counseling

The mission of the Master of Science in Nutrition Program is to educate individuals who are likely to care for underserved populations for advanced professional roles in nutrition. The program trains graduate students to be leaders who identify nutrition problems, develop solutions, and measure impacts to improve the lives of those they serve. Admission requirements include a bachelor’s or higher degree in nutrition, dietetics, or closely related field from a regionally accredited college or university with a cumulative GPA of 3.0. More detailed information about all admission requirements can be found on the CNPD website.

Social Work

The Social Work Department offers a graduate (MSW) and undergraduate (BSSW) degree in social work, both accredited by the Council on Social Work Education. Our programs are available on campus and through innovative, affordable, nationally-recognized distance options. Our programs prepare competent and effective professionals for a strong job market. Social work professionals may work in micro, mezzo, and macro levels in a variety of practice settings, including child and family services, schools, health care, mental health, addictions, aging, and more. Social workers enhance quality of life, eliminate poverty, empower vulnerable populations, and promote social, economic and environmental justice and human rights.

Bachelor of Science in Social Work

The Bachelor of Science in Social Work Program provides students with knowledge, values and skills for generalist social work, with an emphasis on culturally responsive practice in rural communities.
Our program goals are as follows:

- Build upon students' liberal arts foundation to provide knowledge, values and skills necessary for competent social work generalist practice.
- Prepare students for culturally responsive practice to rural communities.
- Prepare students for service and leadership within their community and the social work profession.
- Prepare students for continued professional development opportunities.

**Master of Social Work**

The Master of Social Work Program provides broad access to quality graduate education that prepares versatile advanced generalist practitioners with the necessary knowledge, values, and skills to enhance human well-being and to serve as leaders in their communities in North Dakota, the region, and beyond.

We prepare advanced generalist social work practitioners who:

- have a strong identification with the social work profession, are committed to its highest ethical ideals, and embrace the role of change agent;
- continually strive to increase their cultural competence and understand and respect human diversity;
- understand the forms and mechanisms of oppression and discrimination and advocate for social and economic justice;
- synthesize and effectively apply a broad range of advanced knowledge and skills across practice levels that prepare them to assume leadership roles and work in multi-disciplinary and inter-disciplinary professional capacities; and
- have a passion for critical inquiry and a commitment to lifelong learning.

**Scholarships**

Each year, nursing, nutrition, dietetics and social work majors may apply for CNPD scholarships. Awards and criteria are listed in the CNPD Office of Student Services website and on UND Scholarship Central. Selection is based on a variety of factors including GPA, financial need, disadvantaged background, interest, and potential professional ability. Students in the nursing program are eligible to apply for federal nursing student loans and/or North Dakota Board of Nursing Scholarship/Loans and institutional grants. Additionally, Social Work students may be eligible for a special program that provides assistance to those intending to pursue a career in child welfare.

**Student Organizations**

**College of Nursing and Professional Disciplines Student Council**

The College of Nursing and Professional Disciplines supports a student council that represents the students within the university student governance and serves as an official channel of communication between the student body, the faculty, the administration, the College of Nursing and Professional Disciplines and the University.

**Nursing Student Association**

NSA is the undergraduate nursing student’s pre-professional organization. UND-NSA is affiliated with the North Dakota Student Nurses Association and the National NSA.

**Nursing Honor Society**

Eta Upsilon Chapter of Sigma Theta Tau International is affiliated with the College of Nursing and Professional Disciplines. Sigma Theta Tau is the only honor society for nursing, and fosters excellence, scholarship, and leadership in nursing to improve health care worldwide.

**Student Association of Nutrition and Dietetics (SAND)**

SAND is the student association for all majors and minors within the Department of Nutrition and Dietetics. Information regarding SAND may be obtained from its officers or from the faculty or staff in the department.

**Student Social Work Association (SSWA)**

The Student Social Work Club aims to promote interest in social work as a profession and encourage fellowship among social work students. The association is open to all current and prospective social work majors. SSWA members are involved in planning educational, service, and socialization activities.

**Phi Alpha**

Our national award-winning chapter of the National Social Work Honor Society aims to provide recognition for scholastic achievement of individual students, promote interest in social work as a profession, and encourages fellowship among those training for this profession. Phi Alpha encourages student scholarship, good citizenship, and the practice of high ethical standards.
Student Success Center

The Student Success Center provides comprehensive programs and services to students to aid in the development and implementation of their educational plans and goals. Through the Center’s programs and services, students are empowered to develop the skills and abilities to make a positive adjustment within the campus community.

The Student Success Center concentrates its efforts on the areas of academic advising, orientation, first year success and student transitions, and veteran and non-traditional student services. Within these areas of emphasis, the Student Success Center provides programs and services targeted toward increased student satisfaction, retention, persistence, and completion of intended academic achievements. A focus is placed on students’ successful transitional and academic adjustments into and throughout their educational experiences.

• Academic Advising

The Student Success Center provides quality academic advising for all undergraduate students deciding on a major – new freshmen, transfer, current, and re-entering students. Professional advisors provide academic and referral services to students until a major is declared. The Student Success Center also serves as a resource for professional and faculty advisors across campus.

• Orientation

The Student Success Center coordinates the new student orientation programs, which include freshmen and transfer orientations, and welcomes new students and families to campus with important information needed as they begin their college career at UND.

• First Year Success and Student Transitions

The Student Success Center provides services and programs to ensure that students transition into and through the university successfully. From new students working through their first year to current students transitioning majors, the Student Success Center offers support to students throughout their time at UND.

The Student Success Center offers the following success course: UNIV 101 Introduction to University Life.

• Veteran and Non-Traditional Student Services

The Student Success Center is a place where Veteran and non-traditional students are provided assistance as they navigate the many challenges of college life. Current and prospective Veteran and non-traditional students will find a supportive atmosphere for gathering information and gaining re-entry assistance. Programs and services are delivered throughout the year to meet the unique needs of the Veteran and nontraditional student populations.

Awards/Recognition

Outstanding Academic Advisor Award

Each year the Outstanding Academic Advisor Award is given in recognition of an undergraduate academic advisor who exemplifies outstanding service in the areas of a caring attitude, strong knowledge of UND policies and procedures, and ability to integrate a student’s social, educational, career, and life goals and objectives.

D.J. Robertson Award

The D.J. Robertson Academic Award is presented each fall and spring in recognition of academic excellence by freshman students. These students must achieve a 4.00 grade point average and have completed a minimum of 12 semester hours of traditionally graded coursework.

Thomas J. Clifford Outstanding Freshman Award

The Thomas J. Clifford Outstanding Freshman Award recognizes a sophomore student who, in his or her freshman year, best exemplified the highest academic standards and leadership through participation in University extra-curricular activities and/or community service.

To qualify for the Thomas J. Clifford Outstanding Freshman Award, the student must have completed a minimum of 24 semester hours in two semesters preceding the award. Also, the student must not have completed more than 40 semester hours. This excludes credit earned while in high school and/or credit established through other special examinations. The student must be a present and/or previous recipient of the D.J. Robertson Academic Award.
Summer Session

Scope

Summer Session is an integral part of the academic program at the University of North Dakota. Both undergraduate and graduate courses are taught during the twelve-week Summer Session. In addition to regular classes, special classes, programs, field trips, workshops, conferences, and other short-term activities are conducted.

More than 300 faculty, as well as distinguished visitors, contribute to a quality educational program during the Summer Session. All facilities of the UND campus — including libraries, galleries, music facilities, theatres, lecture halls, dining rooms, and residence halls — are utilized by students attending the Summer Session.

Summer Session Student Body

Typical groups of students found on campus during the summer include: teachers and administrators working toward advanced degrees, students from other colleges, freshman students beginning their academic courses, adults updating their educational backgrounds, professionals wishing to work toward certification, and students wishing to accelerate completion of their degree programs.

Summer Session Schedule

The twelve-week Summer Session allows students to register for a wide variety of courses which meet for various lengths of time during the Summer Session. Most courses are offered on a six-week session. In some instances courses may be taught in sequence.

Classification of Summer Session Students

Full-Time Undergraduate Student

A full-time Summer Session undergraduate student is one who has been admitted to the University and is enrolled in a minimum of nine credit hours during the twelve-week Summer Session.

Part-Time Undergraduate Student

A part-time Summer Session undergraduate student is one who has been admitted to the University and is enrolled for fewer than nine hours of credit during the twelve-week Summer Session. A student must be enrolled in a minimum of one semester hour to be within this part-time classification.
Administration

State Board of Higher Education

The University of North Dakota is a part of the North Dakota University System consisting of ten publicly supported colleges and universities and one branch campus. The State Board of Higher Education is constitutionally responsible for the management of the University and is final authority in all matters affecting the University, exercising jurisdiction over its financial, educational, and other policies, and its relations with the state and federal governments. Certain administrative responsibilities of the Board have been delegated to the Chancellor of the North Dakota University System. The Board entrusts the execution of its plans and policies, together with the internal governance and administration of the University, to the President and the faculty and such other officers as it may select. Board members are appointed for four-year terms.

Board Members

Neset, Kathleen, Tioga, term expires June 30, 2017
Morton, Don, Fargo, term expires June 30, 2020
Hacker, Nicholas, Mandan, term expires June 30, 2019
Melicher, Kevin, Fargo, term expires June 30, 2018
Ness, Mike, Hazen, term expires June 30, 2018
Reichert, Kari, Mandan, term expires June 30, 2017
Stemen, Greg, Fort Ransom, term expires June 30, 2019
Evans, Nick, Marshall, Student Member, named annually to one-year term
Pijning, Ernst, Netherlands, Non-voting Faculty Member, named annually to one-year term
Wakeford, Andy, Devils Lake, Non-voting Staff Member, named annually to one-year term
Hagerott, Mark, Chancellor, North Dakota University System

Administration

Kennedy, Mark R., B.S., M.B.A., Hon. Litt. D., President

Betting, Laurie, P.T., D.P.T., Interim Vice President for Student Affairs
Brekke, Alice, B. Acc., M. Acc., Vice President for Finance and Operations
DiLorenzo, Thomas, Ph.D., Provost and Vice President for Academic Affairs
Faison, Brian, B.A., Director of Athletics
Foster, Angelique, Executive Assistant to the President
Johnson, Peter, B.A., B.S.Ed., Interim Vice President for University and Public Affairs
Wynne, Joshua, M.D., M.B.A., M.P.H., Vice President for Health Affairs and Dean, School of Medicine and Health Sciences
DiLorenzo, Thomas, Ph.D, Provost and Vice President for Academic Affairs

http://und.edu/provost/provost-academic-affairs-office.cfm

Brekke, Alice, M.Acc., CMA, CRA, Vice President for Finance and Operations

Allan, Betty, B.A., Director, Chester Fritz Auditorium
Carper, Christopher, B.A., M.B.A., Manager, University Records
Hanson, Pat, B.S., B.A., CPA, SPHR, SHRM-SCP, Director, Human Resources
Mongeon-Stewart, Karla, M.B.A., CPA, Associate Vice President for Finance
Pieper, Michael, B.B.A., M.S.E., Associate Vice President for Facilities
Plummer, Eric, B.A., M.A., Associate Vice President for Public Safety, University Police Chief

Rogers, Jen, B.A., Special Projects Assistant to the Vice President for Finance and Operations
Smith, Donna, B.A., J.D., Director, Equal Employment Opportunity/Affirmative Action
McGimpsey, Grant, Ph.D., Vice President for Research and Economic Development and Dean, School of Graduate Studies
Aubol, Terry, Assistant to the Vice President for Research and Economic Development
Bowles, Michelle, M.P.A., CIP, Coordinator, Institutional Review Board
Flom, Nicholas, B.S., Executive Director, Northern Plains UAS Test Site
Hoffmann, Mark, Ph.D., Associate Vice President for Research Capacity Building; Director, Computational Research Center; ND EPSCoR Associate Project Director
Katrinak, Karen, PhD., Coordinator, Grand Forks Human Nutrition Research Center
Milavetz, Barry, Ph.D, Associate Vice President for Research and Economic Development, Research Office of Sponsored Programs
Moore, Michael, M.S., C.L.P., Associate Vice President for Corporate Engagement and Commercialization
Sadler, Michael, J.D., Export Control Officer

Betting, Laurie, P.T., D.P.T., Interim Vice President for Student Affairs
Burger, Lisa, Ph.D., Assistant Vice President for Student Academic Services
Carlson, Kenneth, Ph.D., Director, Counseling Center
Carpenter, Angie, M.A., Director, Student Success Center
Dub, Rosy, R.N.-B.C., Interim Director, Student Health Services
Frazier, Connie, M.A., Executive Director, Housing and Dining
Geatz, Lynette, B.B.A., Administrative Officer, Vice President for Student Affairs
Gerhardt, Cassie, Ph.D., Associate Dean of Students and Director of Student Involvement and Leadership
Glennen, Deb, M.Ed., Director, Disability Services for Students
Grew-Gillen, Cheryl, M.S., Executive Director, Memorial Union
Halgren, Cara, Ed.D., Associate Vice President and Dean of Students
Hauschild, Grant, Associate Director of Development for Student Affairs
Lawdermilt, Sherry, M.B.A., Director, Administrative Services Technology
Lukach, Matthew, Relations Manager, One-Stop Student Services
Nilles, Dawnita, M.S., Director, University Children’s Learning Center
Odegard, Ilene, M.A, Director, Career Services
Pokornowski, Alexander, M.Ed., Assistant Dean of Students and Director of Student Rights and Responsibilities
Rosaasen, Orlynn, B.S., Director, Dining Services
Sporbert, Derek, M.B.A., Director, TRIO Programs
Vacant, Director, Wellness Center

Johnson, Peter, B.A., B.S.Ed., Interim Vice President for University and Public Affairs
Brode, Barry, M.S., Director of Television and Radio
Caraher, Susan, B.A., Associate Director of Government Affairs
Novotny, Jill, B.S., Administrative Officer
Wittmann, Fred, M.S., Director of Office of Ceremonies and University Events

Wynne, Joshua, M.D., M.B.A., M.P.H., Vice President for Health Affairs and Dean, School of Medicine and Health Sciences

Basson, Marc, M.D., Ph.D., M.B.A., Senior Associate Dean for Medicine and Research

Dorscher, Joyce Lyn, M.D., Associate Dean for Student Affairs and Admissions

Eken, Randy, M.P.A., Associate Dean, Administration and Finance

Gregory, Dave, Director of Development, School of Medicine and Health Sciences

Halaas, Gwen Wagstrom, M.D., M.B.A., Senior Associate Dean, Academic and Faculty Affairs

Mohr, Thomas, Ph.D., Associate Dean for Health Sciences

Sobolik, Jessica, Director, Alumni and Community Relations

Solberg, Judy, M.P.A., Chief of Staff, Office of the Dean

Athletics Professionals

Adelman, Paul, Director of Ticket Sales and Promotions, Athletics

Anderson, Kyle, Assistant Tennis Coach

Baukol, Nathan, Head Strength and Conditioning Coach

Bennett, Cami, Graphic Design & Operations Coordinator

Bernhard, Mallory, Assistant Women’s Basketball Coach

Berry, Brad, Head Men’s Hockey Coach

Bjorlie, Stacy, Assistant Director, Athletics Academic Services

Brewster, Travis, Head Women’s Basketball Coach

Buchanan, Bobby, Assistant Softball Coach

Clay, Richard, Head Coach, Cross Country

DeVillers, Brian, Assistant Baseball Coach

Dirden, Shawn, Assistant Men’s Basketball Coach

Dodson, Jeffrey, Head Baseball Coach

Doperalski, Kyle, Associate Athletics Director

Elander, Peter, Associate Head Coach, Women’s Hockey

Fabian, Erik, Assistant Women’s Hockey Coach

Faison, Brian, Director of Athletics

Foleske, David, Video Production Coordinator

Freund, Danny, Assistant Football Coach

Gailbraith, Kevin, Head Coach, Track and Field

Gigli, Jordan, Assistant Football Coach

Grabowski, Steve, Assistant Men’s Basketball Coach

Hajdu, Amanda, Assistant Athletics Director, Academic Services

Hajdu, Jason, Assistant Director of Athletics

Harris, Anthony, Assistant Swimming and Diving Coach

Helming, Kara, Associate Director of Athletics, Compliance

Horner, Jeff, Assistant Men’s Basketball Coach

Idalski, Brian, Head Women’s Hockey Coach

Irle, Daniella, Senior Associate Athletics Director/SWA

Jackson, Dane, Associate Head Coach, Men’s Hockey

Jacobson, Adam, Assistant Women’s Basketball Coach

Joki, Erin, Assistant Volleyball Coach

Jones, Brian, Head Men’s Basketball Coach

Jones, Drew, Assistant Track and Field Coach

Kahlbaugh, Travis, Director of Equipment Ops

Kellogg, Matthew, Head Soccer Coach

Kelpinski, Jessica, Director of Operations, WBB

Klamm, Andrew, Equipment Ops Coordinator

Knauf, Luke, Assistant Football Coach

Kostich, Shawn, Assistant Football Coach

Kroke, Alex, Assistant Director of Marketing, Athletics

Kupka, Eric, Equipment Operations Coordinator

Linert, Breanna, Cheer Coach/Advisor; Licensing Coordinator

Lofgren, Adam, Assistant Strength Coach

Magill, Randall, Associate Athletics Director/CFO

Maiello, Chris, Head Swimming and Diving Coach

Martinson, Erik, Director of Facilities and Game Operations

Martinson, Natalie, Head Golf Coach

Maurice, Kevin, Assistant Football Coach

Moser, Lance, Assistant Director, Marketing

Namanny, Jason, Associate Director of Marketing, Athletics

Pryor, Mark, Head Volleyball Coach

Ralston, Paul, Director of Broadcast Properties

Rudolph, Paul, Assistant Football Coach

Schmidt, Eric, Assistant Football Coach

Schweigert, Kyle, Head Football Coach

Schwenzfeier, Aaron, Assistant Strength and Conditioning Coach

Shaw, Matt, Assistant Men’s Hockey Coach

Silvers, Joseph, Assistant Track and Field Coach

Solomon, Martin, Athletics Academic Services Coordinator

Stepps, Travis, Assistant Football Coach

Stevens, Jordan, Head Softball Coach

Strom, Brian, Director of Aquatics, Assistant Swimming and Diving Coach

Swanson, Pat, Operations Manager, Men’s Hockey

Swanson, Tim, Head Men’s Golf Coach

Tabberson, Mia, Assistant Volleyball Coach

Varnadore, Matt, Compliance Assistant
Vaughn, Kevin, Director of Operations, Women’s Hockey
Voight, Jackie, Assistant Women’s Basketball Coach
Webb, Stephanie, Assistant Soccer Coach
Wynne, Thomas, Head Tennis Coach

Other Professionals
Ayers, Elaine, Director, Central Legal Research, School of Law
Fontaine, Cordell, Director, Social Science Research Institute
Hahn, Bryan, Research Associate, Regional Weather Information Center
Jones, B.J., Director, Northern Plains Tribal Judicial Training Institute
Kroeger, Scott, Research Assistant, Regional Weather Information Center
Nordlie, John, Research Associate, Regional Weather Information Center
Toom, Dennis, Research Archaeologist, Anthropology
Faculty

This list is intended for general public information purposes only and must not be construed as an official definitive list of faculty members and their tenure or other status. Also, because the number and locations of clinical faculty in the School of Medicine vary with the departmental appointments, only full-time medical faculty are listed. A listing of clinical faculty may be obtained from the school on request.

* associate graduate faculty status
** full graduate faculty status
*** assistant graduate faculty status
# adjunct graduate faculty status

** Abrahamson, Harmon B., Ph.D., Massachusetts Institute of Technology, Professor of Chemistry
* Abrahamson, Julie, Ph.D., University of Oklahoma, Assistant Professor of Chemistry
* Adams, Daria, Ph.D., University of North Dakota, Associate Dean of Graduate Studies and Clinical Associate Professor of Anesthesia
* Adams Larsen, Margo, Ph.D., Western Michigan University, Assistant Professor of Psychology

Adkins, Mary, MSN, University of North Dakota, Clinical Assistant Professor of Nursing

* Alakaam, Amir, Ph.D., University of Southern Mississippi, Assistant Professor of Nutrition Dietetics
* Alberts, Crystal, Ph.D., Washington University, St. Louis, Associate Professor of English

Allen, Jon W., M.D, University of North Dakota, Director of N.D. Start Simulation Center and Associate Professor of Internal Medicine

Alleva, Patti A., J.D., Hofstra University School of Law, Professor of Law
** Ames, Forrest E., Ph.D., Stanford University, Professor of Mechanical Engineering
*** Amsbaugh, Nicole, M.S., University of North Dakota, Assistant Professor of Physician Assistant Studies

Amundson, Mary, M.A., University of North Dakota, Assistant Research Professor of Family and Community Medicine
* Anderson, Rilla, Ph.D., University of North Dakota, Assistant Professor of Educational Foundations and Research

Anderson, Tracy, M.S., American Sentinel University, Clinical Instructor of Nursing
* Angelone, Alison, M.F.A, Virginia Commonwealth University, Assistant Professor of Theatre Arts
** Antonova, Slavka, Ph.D., Concordia University, Montreal, Professor of Communication
* Askelson, Mark, Ph.D., University of Oklahoma, Professor of Atmospheric Sciences
* Askim-Lovaeth, Mary Kay, Ph.D., Purdue University, Professor of Marketing
* Atkinson, Christopher, Ph.D., University of Kansas, Assistant Professor of Geography
# Baart, Joan, Ph.D., Leiden University, The Netherlands, Adjunct Professor of Linguistics
# Baker, Todd Adam, Ph.D., University of Arizona, Adjunct Professor of Linguistics
** Baker, Mary Elizabeth, Ph.D., University of North Dakota, Professor of Teaching and Learning
** Barbu, Simona, D.M.A., University of Memphis, Assistant Professor of Music
** Barkdull, Carenlee, Ph.D., University of Utah, Associate Professor of Social Work
** Barkhouse, Wayne, Ph.D., University of Toronto, Associate Professor of Mathematics
* Bartz, Jeremiah, Ph.D., University of Oregon, Assistant Professor of Mathematics

* Baegier, Christopher, Ph.D., Indiana University, Assistant Professor of English
* Basson, Marc, M.D./Ph.D., University of Michigan Integrated Premedical-Medical Program/Yale University Graduate School, Professor of Surgery
** Bateman, Connie Rae, D.B.A., University of North Dakota, Professor of Marketing

Beal, James R., Ph.D., University of North Dakota, Associate Professor of Family and Community Medicine
** Beard, Michael, Ph.D., Indiana University, Chester Fritz Distinguished Professor of English
** Beard, Victoria, Ph.D., University of North Dakota, Professor of Accountancy
** Beck, Pamela, M.Ed., University of North Dakota, Associate Professor of Teaching and Learning

Becker, Karin, Instructor of Information Systems Business Communication
* Beneda, Nancy L., Ph.D., St. Louis University, Professor of Finance
* Beno, Virgil, Ph.D., University of Minnesota, Professor of Languages
* Berg, Justin, Ph.D., Washington State University, Associate Professor of Sociology

Berg Burin, Nikki, Ph.D., University of North Dakota, Assistant Professor of History
** Berger, Albert, Ph.D., Northern Illinois University, Professor of History
** Berkold, Angela, Master of Music in Music Therapy, Colorado State University, Instructor of Music
* Berne, Jane, Ph.D., University of Illinois at Urbana-Champaign, Professor of Languages
** Bevelacqua, Anthony, Ph.D., University of Kentucky, Professor of Mathematics

** Bibel, George, Ph.D., Case Western Reserve University-Cleveland, Professor of Mechanical Engineering
# Bickford, Albert Albert, Ph.D., University of California, San Diego, Adjunct Professor of Linguistics
* Biederman, Daniel, Ph.D., University of Kansas, Professor of Economics
* Bishop, Jewel, Ph.D., Arizona State University, Assistant Professor of Nursing
** Bjerke, Elizabeth I., Ph.D., University of North Dakota, Professor of Aviation
* Blackburn, Royce, D.M.A., Indiana University, Associate Professor of Music
* Blake, Michael J., M.Ed., University of North Dakota, Professor of Music
** Boguslawski, Barbara, M.S., University of North Dakota, Clinical Assistant Professor of Nursing
* Borg, Kurt E., Ph.D., North Carolina State University, Director of Assessment, Office of Medical Education and Assistant Professor of Family and Community Medicine
*** Borgeson, Deanna, Ph.D., University of North Dakota, Associate Professor of Teaching and Learning

Borho, Alan, B.S., University of North Dakota, Instructor of Atmospheric Sciences

** Bowman, Frank, Ph.D., California Institute of Technology, Associate Professor of Chemical Engineering
* Boyd, Amanda, Ph.D., University of Massachusetts, Associate Professor of Languages

Boyd, Shaw, Ph.D., University of Illinois, Assistant Professor of Languages
** Braathen, Sandy, Ph.D., University of Minnesota-St. Paul, Professor of Information Systems and Business Education
** Bradley, April, Assistant Professor of Psychology; M.S., University of Texas, Associate Professor of Psychology
** Bradley, David S., Ph.D., University of South Dakota School of Medicine, Associate Professor of Basic Sciences

Brammell, Lindsey, M.A., San Francisco State University, Assistant Professor of Art and Design
* Bridewell, John, Ed.D., University of South Dakota, Professor of Aviation
** Brissette, Catherine A., Ph.D., University of Washington, Assistant Professor of Basic Sciences
** Broedel, Hans, Ph.D., University of Washington, Associate Professor of History

Broedel, Sheryl, Instructor of Information Systems Business Communication
** Brown-Borg, Holly, Ph.D., North Carolina State University, Chester Fritz Distinguished Professor of Basic Sciences
* Buettner, Kevin, M.S., University of North Dakota, Assistant Director and Clinical Assistant Professor of Anesthesia
** Burin, Eric, Ph.D., University of Illinois-Champaign, Professor of History
* Byars, Bruce, J.D., University of North Dakota, Associate Professor of Accountancy

Cakir, Deniz, Ph.D., Bilkent University, Ankara/Turkey, Assistant Professor of Physics
* Campbell, Caroline, Ph.D., University of Iowa, Associate Professor of History
** Campbell, Katherine, Ph.D., University of Washington, Professor of Accountancy
** Ferraro, F., Richard Richard, Ph.D., University of Kansas, Chester Fritz Distinguished Professor of Psychology  
** Fevig, Ronald, Ph.D., University of Arizona, Associate Professor of Space Studies  
Fiala, Amy, B.S.N., University of North Dakota, RAIN Mentor and Clinical Instructor of Nursing  
** Fink, Kim W., M.F.A., Tyler School of Art, Temple University, Professor of Art and Design  
** Fitzgerald, John, Ph.D., University of Minnesota, Assistant Professor of Kinesiology Public Health Education  
** Flanagan, Kenneth, Ph.D., Ohio State University, Associate Professor of Social Work  
* Flesham, Sherrie, Ph.D., University of Oregon, Associate Professor of Languages-French  
** Flom-Meland, Cynthia, Ph.D., University of North Dakota, Associate Professor of Physical Therapy  
** Flynn, David T., Ph.D., Indiana University, Professor of Economics  
** Flynn, Michael, Ph.D., Washington University, St. Louis, Associate Professor of English  
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