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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,

Edward T. Schafer
President
# 2016-17 Academic Calendar

*(Subject to Change)*

## Fall Semester 2016-2017 (1710)

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<tr>
<td>Beginning of instruction, 4 p.m.</td>
<td>August 22</td>
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<tr>
<td>Last day for advancement to candidacy for all graduate students planning to graduate in December</td>
<td>August 22</td>
</tr>
<tr>
<td>Last day to add a full-term course or drop without record</td>
<td>August 31</td>
</tr>
<tr>
<td>Last day to change to or from audit grading for a full-term course</td>
<td>August 31</td>
</tr>
<tr>
<td>Holiday, Labor Day</td>
<td>September 5</td>
</tr>
<tr>
<td>Last day for students to submit incomplete work from Spring and Summer to instructors or petition for extension of incomplete</td>
<td>September 16</td>
</tr>
<tr>
<td>Last day graduation candidates may apply for a degree</td>
<td>September 20</td>
</tr>
<tr>
<td>Last day for instructors to submit Removal of Incomplete Grade form to Registrar</td>
<td>September 30</td>
</tr>
<tr>
<td>Holiday, Veteran’s Day</td>
<td>November 11</td>
</tr>
<tr>
<td>Last day to drop a full-term course or withdraw from school</td>
<td>November 10</td>
</tr>
<tr>
<td>Last day to change to or from S/U grading for a full-term course</td>
<td>November 10</td>
</tr>
<tr>
<td>Last day to submit Thesis/Dissertation “Preliminary Approval,” “Notice of Defense” and format copy to the School of Graduate Studies</td>
<td>November 17</td>
</tr>
<tr>
<td>Thanksgiving recess</td>
<td>November 24-25</td>
</tr>
<tr>
<td>Last day for Thesis/Dissertation Defense</td>
<td>December 1</td>
</tr>
<tr>
<td>Last day for faculty to submit “Final Report on Candidate” form to the School of Graduate Studies</td>
<td>December 8</td>
</tr>
<tr>
<td>Last day to submit final copy of electronic Thesis/Dissertation for publishing</td>
<td>December 8</td>
</tr>
<tr>
<td>Reading and Review Day</td>
<td>December 9</td>
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<td>Semester examination period</td>
<td>December 12-16</td>
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<tr>
<td>Winter Commencement and Official Graduation Day</td>
<td>December 16</td>
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<tr>
<td>Grades due from faculty to the Office of the Registrar at noon CST</td>
<td>December 20</td>
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## Spring Semester 2016-2017 (1730)

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<td>Beginning of instruction, 4 p.m.</td>
<td>January 9</td>
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<tr>
<td>Last day for advancement to candidacy for all graduate students planning to graduate in May</td>
<td>January 9</td>
</tr>
<tr>
<td>Holiday, Martin Luther King Jr. Day</td>
<td>January 16</td>
</tr>
<tr>
<td>Last day to add a full-term course or drop without record</td>
<td>January 19</td>
</tr>
<tr>
<td>Last day to change to or from audit grading for a full-term course</td>
<td>January 19</td>
</tr>
<tr>
<td>Last day for students to submit incomplete work from Fall to instructors or petition for extension of incomplete</td>
<td>February 3</td>
</tr>
<tr>
<td>Last day graduation candidates may apply for a degree</td>
<td>February 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 others 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/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 VII, ADA, and Section 504 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/.

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. 777.2581 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
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/student-affairs/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. (p. 8) 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. For more information, contact the UND Police Department at (701) 777-3491, visit the UND Police Department web page at: http://www.police.und.edu, 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 person 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/dep/fraudhotline/index.html and http://www.und.edu/dep/rds/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 8-2: 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 insure 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, Suzanne Anderson, Registrar, and the UND School of Graduate Studies, Wayne Swisher, Dean.
General Information

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The University: Scope, History, Mission, Accreditation

The Scope of the University

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 229 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 30 programs, the specialist’s degree in one program, and the master’s degree in 61 programs).

In the fall of 2015, about 37 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 3,109 degrees in 2014-2015, including 1,948 undergraduate degrees, 747 master’s degrees, 133 doctoral degrees, 80 law degrees, 55 M.D. degrees, and 78 post-bachelor/post-master certificates.

The University had $97.4 million in total research and sponsored program expenditures in fiscal year 2015.

Faculty at the University number 828, with a total workforce of 2,763.

UND’s 548-acre campus, regarded as one of the most beautiful in the region, includes 244 buildings and more than 6.6 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, Hughes Fine Arts Center, and Hyslop Sports 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, 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. 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 7-900; 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 777-2387 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). The Twamley Snack Bar offers some breakfast fare, full noon lunches, and convenience store food items. It is open from 8:30 a.m. to 3:00 p.m., Monday – Friday. 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 a.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 court 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 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.

Packing 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/visitor-application.cfm or at Parking Services in Twamley Hall, Room 204. The navigation to purchase a student permit in Campus Connection is: Self Services>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.

Picking 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 8, 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 FY2015, $90.93 million of external grants and awards was received for such activities. Internal support from various university funds amounted to $2.1 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
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 research, development, demonstration, and commercialization facility recognized as one of the world’s leading developers of cleaner, more efficient energy technologies, as well as environmental technologies to protect and clean our air, water, and soil. The EERC provides practical, cost-effective solutions to today’s most critical energy and environmental challenges. The EERC’s research portfolio consists of a wide array of strategic energy and environmental solutions, including oil and gas, coal utilization, emission control, climate change and carbon management, water management, renewable energy and alternative fuels, hydrogen, and environmental chemistry and reclamation. The EERC employs over 210 highly skilled scientists, engineers, and support personnel. The majority of the work at the EERC involves competitive contracts with the private sector.

**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.

**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. 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 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.

**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 Glioma Prognosis Kit
- 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 of Health in ND Youth Athletes
- Graphene-based Nanomaterials for Biodetection and Bioimaging
- Improved Engineered Coatings for Aerospace and Naval Applications

**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 change, satellite remote sensing of the atmosphere and weather, 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.
• Law Enforcement Unmanned Aircraft Systems Research Project
• Limited Deployment Cooperative Airspace Project
• Novel Anti-Inflammatory Drugs for Treating Alzheimer’s Disease
• Petroleum Research, Education, and Entrepreneurship Center of Excellence
• Proof of Concept Cloud Condensation Nucleus Counter for Unmanned Aircraft Systems
• Radio Frequency Wireless Power for Industrial Sensors
• Research and Development of Immunotherapeutic and Vaccine Candidates for Porcine Epidemic Diarrhea Virus
• SmartSealz: Pilot/Operator Navigation Augmentation and Physiological Monitoring Headset
• Stingray: Integrating Beyond Visual Line of Sight (BVLOS) Communications Capability into UAS
• Structural Characterization of Candida Vaccines
• Technical and Economic Feasibility Analysis of Next Generation Valley City State University Heating Plant
• UAS Software and Curriculum Development
• Unmanned Aerial Systems for Building Assessment

Human Nutrition
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 life sciences and advanced engineering projects companies. The Tech Accelerator is a facility where small tech-based companies can find 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.

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. Odégard School of Aerospace Sciences Department of Aviation. Together, students who share a passion for aviation live and learn together in Noren Hall. Students have the chance to focus on academic achievement in a productive and supportive setting and gather 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 e_bjerke@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
UND 101 Introduction to University Life is a course for freshman 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 graduate or professional schools that the graduate is a serious, well-prepared, accomplished student.

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 2016*

(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>$3,982.34</td>
<td>$4,375.34</td>
<td>$5,619.34</td>
<td>$9,449.34</td>
</tr>
</tbody>
</table>
**Estimated Yearly Expenses**

Graduate $4,230.34 $5,181.34 $5,991.34 $10,111.84
Law $322.63 $454.43 $454.43 $762.89
Medicine $14,747.84 $16,151.34 $26,694.84 $26,694.84
Physical Therapy $7,197.34 $7,197.34 $9,685.84 $9,685.84

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Since the University of North Dakota is supported by legislative appropriations, tuition and fees paid by students constitute only a part of the actual cost of the student’s education. An individual registration is not complete until all tuition/fees are paid. Tuition for North Dakota’s institutions of higher education is determined annually by the State Board of Higher Education. In addition, the Board authorizes the individual institutions to collect certain other mandatory fees, which in 2015-16 totaled $708.34 per semester at UND (and is included in the above table). These include the student fees which support, among other functions, Student Government, Student Health, Bonds, Wellness, Memorial Union, Career Services, Substance Abuse Prevention Programming, Multicultural Student Services, Athletics, Student Success Center and the Judicial/Crisis Team, $569.98; the ConnectND Fee, $66, and the NDSA Fee, $0.36, which support functions that are managed at the N.D. University System level; and the Technology fee, which supports technology needs, $72. Most student fees were approved by votes of the student body. All tuition and fee charges become the responsibility of the student when the student enrolls in courses at the University of North Dakota.

The student accepts responsibility for payment of tuition and fees when he/she enrolls in classes at the University of North Dakota.

No paper bills are sent from UND. Students are required to check their account balances on Campus Connection. Log into Campus Connection>Account Summary.

For more current information on tuition and fee rates, visit the Student Account Services website at: [http://und.edu/admissions/student-account-services/index.cfm](http://und.edu/admissions/student-account-services/index.cfm)

* All fees are subject to change without notice; contact the Office of Enrollment Services for up-to-date cost estimates. Part-time students taking 11 or fewer hours are billed on a per-credit hour basis.
* Online courses are charged at the resident rate and are not subject to the 12-credit billing cap and are charged on a per-credit basis. See schedule in Office of Extended Learning section of catalog.
* In addition to this tuition/fee schedule, program fees are assessed in the College of Business and Public Administration, Engineering, Law, Nursing, Teacher Education, Social Work, Recreation, Anesthesia and Diabetics.
* Additional course and/or program fees maybe charged based on the student’s enrollment.

**Example of potential negative financial impact from student not knowing the difference between Online and On-Campus course billing:**

**Student A**

Student enrolls in 12 credits of On-Campus courses and 3 credits of Online courses:

Student A is billed for 15 credits of tuition plus online course fees.

*Advising a student to substitute an online course for an on-campus course could impact them financially.

**Student B**

Student enrolls for 15 On-Campus credits:

Student B is billed for only 12 credits per the 12-credit cap on charges for on-campus courses.

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**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, 2015-2016 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; Non-Resident WUE States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees</td>
<td>$7,965</td>
<td>$8,751</td>
<td>$11,239</td>
</tr>
<tr>
<td>Room and Meal Plan</td>
<td>$7,295</td>
<td>$7,295</td>
<td>$7,295</td>
</tr>
<tr>
<td>Books and Supplies</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>
</tr>
<tr>
<td>Total Est. Costs</td>
<td>$19,660</td>
<td>$20,446</td>
<td>$22,934</td>
</tr>
</tbody>
</table>

* Plus matriculation fees ($35 one time)
** Costs based on UND residence hall rates (double room and unlimited access meal contract) and includes the Association of Residence Halls fee.

For more current information on tuition and fee rates, visit the Student Account Services website at: [www.und.edu/finance-operations/student-account-services/index.cfm](http://www.und.edu/finance-operations/student-account-services/index.cfm)

**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](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 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;
4. A person who graduated from a North Dakota high school;
5. 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];
To be certified for reciprocity at UND, Minnesota students must do two things:

1. The institution of higher learning and pay a special tuition rate that is lower than the
   Residents of Minnesota and their dependents may attend a North Dakota state

2. Minnesota Tuition Reciprocity

Account Services for requirements.

Residents of Minnesota who are not refugees must have an Alien
purposes, international students who are not refugees must have an Alien

To qualify as a North Dakota resident for tuition
International Students: To qualify as a North Dakota resident for tuition
purpose, requirements for tuition purposes. Refugee students should contact Student

Legal residence in the State of North Dakota includes, but is not
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

Resident 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.

Legal 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

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 UND Student Account Services of your approval by completing the
   MN Reciprocity Request form at https://apps.und.edu/forms/index.cfm?
or call Student Account Services at 701-777-3911 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
Student Account 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)

Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada,
New Mexico, Oregon, South Dakota, Utah, Washington, Wyoming, and the
Commonwealth of the Northern Marianas Islands

• 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

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/admissions/student-account-services/withdrawal.cfm.
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 Student Account Service’s web page: http://und.edu/admissions/student-account-services/.

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

November 30, 2015: Student enrolls in 12 credits at a cost of $3,627.04.

January 23, 2016: Last Day to Drop with a Refund or Withdraw for a 100% Refund.

January 26, 2016: 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, 2016: Student receives 0% refund on dropped courses.

Still owes $3,627.04

February 3, 2016: 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/admissions/student-account-services/.

Contact Student Account Services to determine the potential financial impacts of course changes or withdrawal from UND: 701.777.3911; SAS@UND.edu; Twamley Hall, Room 204.

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 UND Refund Choice Card. For more information on UND refund choices, please visit: http://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. Please review this policy and others 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 Financial Aid Office.

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.
Financial Aid Procedures and Award Policies

April 15 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 April 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 April 15. 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.

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

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 are often 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.

• Composition 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 role 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.
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.

b. The maximum time frame standard will be reviewed at the end of each regular period of enrollment.

c. The maximum time frame standard will be reviewed at the end of each regular period of enrollment.

Minimum Percentage of Completed Hours

1. In order to earn enough credits to graduate within the above maximum number of attempted hours, students are required to successfully complete two-thirds (66.667%) of the cumulative credit hours at tempted.

2. The percentage of completed hours standard will be reviewed at the end of each regular period of enrollment.

3. A student can receive federal financial aid if they have two different careers, i.e., undergraduate and graduate, if they are enrolled in at least six credits in their primary career. Students that are interested in the 3/2 combined programs should be advised to speak to financial aid to make sure their financial aid is not canceled or adjusted.


Repayment of Financial Aid

Financial aid funds can be used only for educational expenses. Therefore, repayment may have to be made if a student officially or unofficially withdraws from the University. If withdrawal is before first day of classes, or if the student fails to pay tuition, all cash disbursements are overpayments and must be repaid in full. If withdrawal is on or after the first day of classes, the University will determine the amount of "unearned aid" to be repaid according to a federal formula. To officially withdraw, a student must complete a withdrawal form at the Registrar’s Office, 201 Twamley Hall. If a student does not officially withdraw, the unofficial withdrawal date will be the student’s last documented date of attendance or the midpoint of the semester, whichever is later.

Access to Records

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 educational 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. To inquire about your financial aid file students must complete the FERPA Release (https://apps.und.edu/forms/login.cfm) form through Student Account Services.

Student Employment

Student employment provides financial assistance and reduces students’ loan indebtedness. There are several student employment programs which complement the students’ learning and give the University the opportunity to utilize student skills.

Federal Work-Study (FWS) is a form of federal aid based on financial need, and is awarded to students as part of their total aid package. A FWS award indicates a student’s eligibility to seek available FWS jobs. Wages are paid primarily from federal funds allocated to the University.

Wages for institutional (INST) employment are paid from funds allocated to individual University departments. Financial aid is not a requirement.

All students who work through FWS and/or INST employment will be hired at least at the federal minimum wage rate. Wage rates vary, depending upon the skills required and job responsibilities.

The grievance procedure for student employees is described in the Code of Student Life.

Job Location and Development (JLD) is a cooperative effort with Job Service North Dakota to secure part-time work for students with area businesses. Although financial need is not a requirement, jobs secured through JLD can be part of a financial aid package.

Veterans Work-Study is a program for veterans attending school full-time and receiving VA benefits. Veterans can work up to 250 hours a semester and be paid at the minimum wage. Eligibility is determined by the Veteran Services office on campus.

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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  - Museum of Art, North Dakota (p. 29)
  - Office of Human Resources (p. 27)
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  - One-Stop Student Services (p. 29)
  - Radio, UND (p. 29)
  - RecSports (p. 29)
  - Registrar, Office of the (p. 29)
  - Religious Activities (p. 29)
  - Research Development and Compliance (p. 30)
  - Speech, Language and Hearing Clinic (p. 30)
  - Student Affairs, Division of (p. 30)
  - Student Financial Aid Office (p. 30)
Academic Support

McCannel Hall, Room 180
Phone (701) 777-3398, FAX (701) 777-3397
und.academicsupport@und.edu
http://und.edu/student-affairs/student-services/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 located on the 2nd floor of the Memorial Union. A complete listing of subjects and times for drop-in tutoring may be found at: http://und.edu/student-affairs/student-services/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 a program designed to promote and foster the academic and personal success of American Indian and other underrepresented students enrolled at the University of North Dakota. AISS works directly with the UND Enrollment Services 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.

The AISS Student Success Program is a student success program designed for American Indian and other underrepresented students at UND that monitors their academic progress, gives guidance and direction, provides 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 at UND. Students are encouraged to utilize the AISS tutoring program and tutoring services available elsewhere on campus. 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. The American Indian Student Learning Lab provides opportunities for students to enhance their computer skills.

The American Indian Center houses AISS and the Student Learning Lab. 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 and elsewhere on campus. All UND students are welcome and encouraged to utilize the American Indian Center and AISS services.

Art Museum

(see North Dakota Museum of Art (p. 29))

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 are able to access job and internship opportunities, become available to employers who search the database, 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)

Robertson-Sayre Hall/Memorial Union Lower Level
Main Office: 701-777-2129
Tech Support 707-777-6305
http://und.edu/academics/cilt/

The mission of the Center for Instructional & Learning Technologies (CILT) is to collaborate with the University community to provide support for students, faculty and staff in the pursuit of innovation and excellence in teaching and learning with technology. CILT is located in Robertson-Sayre Hall and the Memorial Union. 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, collaboration stations, and multimedia production). Contact and more information can be found at: http://und.edu/academics/center-for-instructional-and-learning-technologies/.

Ceremonies and Special Events, Office of

407 Twirenkey Hall
Phone (701) 777-6393

The Office of Ceremonies and Special 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 Special 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/childrens, 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
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 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 Psychology Practicum training program, A&D Consortium intern and International Association of Counseling Services (IACS) accreditation

CLINICAL 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.

Dean of Students Office and Associate Vice President for Student Services
190 McCannel Hall
Phone (701) 777-2664

In support of the missions of the University and the Division of Student Affairs, the mission of the Dean of Students Office is to work with students to achieve their educational ambitions by helping them address and eliminate barriers that impede their academic success.

The Dean of Students Office supports the campus learning environment and contributes to student learning and the overall safety and civility of the community:
• General advisement and campus consultation
• Provides student disciplinary services
• Coordination of referrals and services for students in crisis or in need
• Assistance in problem solving or identifying appropriate and available services

Dining Services
(see Housing (p. 26) and Dining)

Disability Services for Students
180 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/

Equal Opportunity/Affirmative Action
401 Twamley Hall
701.777.4171
email: und.affirmativeactionoffice@UND.edu
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
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, dramas, 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. 30))

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 (1948) a professional fraternity, has for its purpose the recognition of merit among those enrolled in the study of geography.

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 (NRHHA) recognizes and elects to membership the top 1% of the most involved residence hall student leaders.

Omicron Delta Epsilon confers distinction for academic excellence in economics.

(The) 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 Iota Epsilon (1996) is a national 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.

Kappa 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 residence halls, apartment style housing, and apartments for single students and families.

**Residence Halls**

All first-year undergraduate students who have less than 24 transferable, post-secondary, semester credit hours and who enroll full-time at UND within one year of their high school graduation or equivalent, are required to live in a residence hall on campus for their first full academic year. Exceptions 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.

UND has 13 traditional residence halls which are conveniently located throughout campus. All halls have laundry facilities, kitchensettes, and study areas. Individual rooms have desks, single beds with loft, dressers, chairs, bookshelves, wireless internet access, and cable TV service.

University Place offers apartment style housing and is an option for upper-class students looking for a more independent lifestyle, personal space, and amenities. Students must have achieved sophomore status (completed 30 post high school credits) to be eligible to live in this building. Students living in University Place are not required to purchase a meal plan. Each unit is furnished and includes a shared living room and kitchen area complete with a dishwasher, stove, refrigerator, and microwave. The building features air conditioning, wireless access, a coffee shop, convenience store, meeting rooms, and lounge spaces.

For more information and 360 Tours visit the website at http://und.edu/student-life/housing.

**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 850 apartments (furnished and unfurnished) for single students and families. Eligible students must meet one of the following criteria: have completed 60 or more credits, be 21 years of age or older, be legally married or in a domestic partnership, or be a parent/guardian. Residents enjoy a variety of social and cultural events at the University Apartment Community Center. In most cases, the rent includes heat, water, garbage removal, basic cable TV, and internet access (electricity and phone not included). Applications and information about the specific types of apartments and current rates are available on the web at http://und.edu/student-life/apartments or contact the Housing Office, University of North Dakota, 525 Stanford Road, Stop 9029, Grand Forks, ND 58202-9029, (701) 777-4251. 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.

Faculty Housing
Faculty/staff housing is a service provided by the University of North Dakota to ease the transition for new employees to the University and the Grand Forks community. To qualify for a faculty assignment, applicants must contact the Dean of their college for one of that college's annual faculty housing allocations. For more information and current rates visit the website at http://und.edu/student-life/housing/apartments/faculty-apartments.cfm.

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. Three dining centers are open to students, faculty, and staff and are located in Wilkerson Commons, Squires Hall, and the Memorial Union (Terrace). The wide variety of daily meals include two or more main entrées, vegetarian entrée, soups, salad bars, and specialty food bars such as Mexican, Asian, Deli, and Pasta. Residence hall students are required to choose an unlimited access or unlimited access plus meal plan. Returning students can purchase a block meal plan. Off-campus students, faculty, and staff may pay cash or purchase special meal plans. Dining Services offers resources to help students make good menu choices. UND has partnered with Guiding Stars to offer students a food rating system. The more nutritional value a food has, the more Guiding Stars it receives. Foods are marked with easy-to-follow tags indicating 1, 2, or 3 stars. 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 (soups, sandwiches and wraps featuring North Dakota products). Stomping Grounds Coffee Shop in the Memorial Union and University Place 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 Administrative Aerospace Center, Airport.

Convenience stores are located in Wilkerson Commons, Walsh Hall, University Place, and the Memorial Union, and snack and juice vending machines are available at several locations on campus.

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 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.

Office of Human Resources
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) 777-3325, 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, baseball, 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 Centre, 2908 University Avenue
Phone (701) 777-4231, FAX (701) 777-4773
und.internationalprograms@und.edu
und.edu/academics/international-programs

The UND Office of International Programs (OIP) 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 OIP works to encourage global understanding through education abroad, cultural programming, and support of international students and scholars.

To achieve its goal, the OIP 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 Office of International Programs is composed of a director, two education abroad program managers, three international student advisors, an international scholar advisor, and an office manager.

The Office of International Programs is located in the International Centre. Office staff is available Monday through Friday from 8 a.m. to 4:30 p.m. The International Centre is open Monday through Friday from 8 a.m. to 8 p.m.; closed on weekends; holiday hours may vary. Computers, comfortable study space, coffee, and tea are 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 numbering over 3 million items, 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, within the University’s distance education network and throughout North Dakota. The University’s library system includes the Chester Fritz Library and branch libraries (Energy & Environmental Resource Center, Geology and Music), plus the Thormodsgard Law Library and Harley E. French Library of the Health Sciences which serve the graduate professional schools of law and medicine.

The University libraries provide scholarly information and publications in print, microform, audio-visual and digital formats. Many of the digital resources are available through computer networks allowing access from campus, home, office and off-campus locations. 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 and the Chester Fritz Library administers the only U.S. Patent and Trademark collection in North Dakota. 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 conduct computer-assisted searches 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 informational resources not held locally.

The libraries provide educational services including 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

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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 Café. 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 for 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.

Ombuds Office

Ombuds Office (OO)
Tel: 701.777.6239
314 Cambridge St. Room 201
Grand Forks, ND 58202

The OO is a safe, informal, and confidential place for you to receive help in managing your differences with others, lest they become formal and public conflicts. You don’t have to pay any fees to use the OO, and all services are voluntary. The OO is not an advocate of any group on campus, whether they be staff, students, faculty, or leadership; instead, the OO remains impartial (multi-partial) and independent.

For which issues would you contact the OO?

- bullying
- cultural competence
- tenure/promotion
- resignation/termination
- deadlines
- communication
- supervisory and managerial relationships

Visit http://und.edu/ombuds/ online or drop by the OO in person for more information.

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 teams, individual or dual events every 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-Darley 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 ensuring 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)
und.edu/financial-aid

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 701-777-2605 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.

Studio One

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

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 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 3.5 million people can watch Studio One. The program is telecast 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. 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 a 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.

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 telecast 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 selected 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 Prometric 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 doctoral level.

U Card

Room 3, Lower Level, Memorial Union
Phone (701) 777-2071
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.

Students may also use their U Card as a debit card by depositing funds in $25 increments into their debit account. The U Card debit account is accepted at a number of campus locations. Family members may deposit funds into the debit account. 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 leans 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 Twamley 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 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 and 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 and Military Services

314D Memorial Union
Phone (701) 777-3364

The Veteran Services Office certifies eligible students and veterans for VA educational benefits and acts as a liaison between the student and the VA. Services also include providing students/veterans with information regarding VA policies and procedures, providing information about the University, and assisting students/veterans in the readjustment and adaptation to the university setting. The office also provides information on financial aid and tutorial assistance. Referrals to other service 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
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](http://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
Montgomery Hall, Room 325, 290 Centennial Drive, Stop 8178
Grand Forks, ND 58202-8178

**ONLINE:** [www.graduateschool.und.edu](http://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/](http://und.edu/)

(Also see the A-Z Index ([http://und.edu/a-z](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

Admission

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

- High school GPA unweighted of 2.5 (fall 2015) and 2.75 (fall 2016)
- ACT of 21 (fall 2015) and 22 (fall 2016) or SAT of 990 (fall 2015) and 1020 (fall 2016) scores (including sub-test scores)
- Completion of the high school core curriculum for collegereadiness
- 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 2015 and 2016 (total of 13):

- 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 2017 (total of 14), and two additional core courses are 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 150 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. New GED testing scores will be available in 2014 and 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

A transfer student must be in good academic standing and be eligible to return to any college or university attended. 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 Educator’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 directly 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 can still 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 he 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. 344) 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 GPAs 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.
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. 46) 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. 612) 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, check: 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 degree.

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 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. 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 within 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 rosters 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.

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 “withdraw” 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:

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<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>
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<tr>
<td>S</td>
<td>Satisfactory</td>
<td></td>
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<tr>
<td>U</td>
<td>Unsatisfactory</td>
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<tr>
<td>W</td>
<td>Withdrawn</td>
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<tr>
<td>WAU</td>
<td>Withdrawn from Audit</td>
<td></td>
</tr>
<tr>
<td>AU</td>
<td>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.

Incompletes are entered on the final grade roster, and instructors must submit by email 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 "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 Classes." 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 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.
3. 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.
4. 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 select certain courses to be part of the seven-year rule, but must include all courses which are seven years or older. Such courses and their actual grades
would appear on the student’s academic record, but letter grades would not be calculated for GPA purposes. Excluded courses could not be used to satisfy any academic requirement.

A student requesting this option must have a written petition approved by the student’s academic advisor, department chairperson, and Dean of the college from which the degree is sought. If the student changes degree college after approval of this petition, the student would be required to petition again.

Deficiency Reports

Individual mid-term reports of unsatisfactory work (i.e., D, F, and U) of students are made by all instructors at the end of the first eight weeks of the semester. A grade of D is considered unsatisfactory although it is a passing grade. The Registrar sends deficiency reports to students who have been reported deficient. Reports of deficiency are also sent to the academic deans and advisors to be used for advisement purposes. Deficiency grades do not appear on the student’s permanent record. It is also the student’s responsibility to keep informed of his/her own performance in a class.

Semester Grade Reports

Grade reports are available to students by accessing their records after term grades are posted through UND CampusConnection. Grade reports are not mailed, but a printed copy is available upon written request.

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 $5. 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 incompletion 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/student-affairs/code-of-student-life/](http://und.edu/student-affairs/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 IIIa in the Code covers academic concerns (grievances and standards) and Section II 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 Dean of Students Office, 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>
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</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/accounting

Altepeter, Byars, Campbell, Carlson (Chair), de Magalhaes, Dosch, Ellingson, Hansen, Harmeson, Loyland, Notbohm and Wilde

College of Business and Public Administration

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

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. The accounting programs offered by the faculty provide the range of experience and knowledge needed for success as a professional accountant. The faculty’s programs also fulfill general University and College of Business graduation requirements.

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.

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 Finance. The B.Acc. program is designed 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 accountancy, 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) or a Certified Financial Manager (CFM). Both the CMA and CFM are national designations that also require the passage of a national examination. Students have the option to emphasize either managerial finance or corporate accounting with the available electives.

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 and 30 hours of business courses and at least 150 semester hours of college courses.

The B.Acc. program meets the current requirements for accounting and business courses, however, the B.Acc. program does not meet the 150 hour requirement. Students interested in becoming CPAs should be prepared to either extend their undergraduate program by an additional 24 credit hours or to continue their study at the graduate level. The most likely graduate alternative would be the Master of Accountancy (MAcc) or the Master of Business Administration (MBA).

The Certified Managerial Accountant (CMA) Examination

The Institute of Management Accountants (IMA) establishes the standards or criteria for achieving the CMA designation. While the CMA examination is similar to the CPA examination, the CMA examination concentrates more heavily on corporate accounting and financial analysis.

B.B.A. with Major in Managerial Finance and Accounting (p. )

Bachelor of Accountancy

Required 126 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 College listing and including:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ACCT 201</td>
<td>and Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
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<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>
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<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>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
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<tr>
<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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<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
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<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
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<td>MKRT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
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<td>POLS 115</td>
<td>American Government I</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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Select one of the following: 3

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<td>PSYC 111</td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
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<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
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Total Credits 55

III. The following Major Requirements:

<table>
<thead>
<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>6</td>
</tr>
<tr>
<td>&amp; ACCT 302</td>
<td>and 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>
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<td>ACCT 320</td>
<td>Cost Accounting</td>
<td>3</td>
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<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 410</td>
<td>Federal Individual Income Tax</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 412</td>
<td>Advanced Tax</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 416</td>
<td>Advanced Business Law</td>
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<tr>
<td>ACCT 403</td>
<td>Contemporary Accounting Theory</td>
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<tr>
<td>ACCT 406</td>
<td>Independent Assurance</td>
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<td>ACCT 410</td>
<td>Federal Individual Income Tax</td>
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<tr>
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<td>Advanced Tax</td>
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</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 College listing) and including:

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<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>
<td>Money and Banking</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
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<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>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
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<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
<td>3</td>
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<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>
<td>3</td>
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Select one of the following: 3

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<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
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</table>

Total Credits 55

University of North Dakota

47
III. The following Major Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACCT 218</td>
<td>Advanced Spreadsheet Applications</td>
<td>3</td>
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<tr>
<td>ACCT 301</td>
<td>Intermediate Accounting I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ACCT 302</td>
<td>and Intermediate Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 309</td>
<td>Accounting Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 320</td>
<td>Cost Accounting</td>
<td>3</td>
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<tr>
<td>FIN 340</td>
<td>Intermediate Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 350</td>
<td>Financial Statement Analysis</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 475</td>
<td>Cases in Managerial Finance</td>
<td>3</td>
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<tr>
<td></td>
<td>At least three upper-division courses from Accountancy or Finance</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>36</td>
</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,SS.

**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 and pre-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,SS.
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 8380, 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>
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<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>
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<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>
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</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>
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<td>1</td>
</tr>
<tr>
<td>AS 212</td>
<td>The Evolution of USAF Air and Space Power II</td>
<td>1</td>
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</table>

AS 210 Leadership Laboratory is a corequisite of

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>AS 410</td>
<td>Leadership Laboratory</td>
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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 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>
</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>
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</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. 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 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 nonreservation 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>
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</thead>
<tbody>
<tr>
<td>IS 230</td>
<td>Approaches to Native Cultures</td>
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</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>IS 395</td>
<td>Ethnography of North America</td>
<td>3</td>
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<tr>
<td>IS 410</td>
<td>Indigenous Identities</td>
<td>3</td>
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<tr>
<td>IS 202</td>
<td>Cultures of the Sioux</td>
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</tr>
<tr>
<td>IS 203</td>
<td>History of the Anishinabe</td>
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<tr>
<td>IS 204</td>
<td>Cultures of the Anishinabe</td>
<td></td>
</tr>
<tr>
<td>IS 207</td>
<td>History of the Three Affiliated Tribes</td>
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<tr>
<td>IS 208</td>
<td>Cultures of the Three Affiliated Tribes</td>
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</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,S,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. White Images of Native Americans. 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, historical accounts, sociology, etc. 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

or IS 202. Cultures of the Sioux
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 Anishinabe. 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 discusses appropriate methodologies. 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 influence 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 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.
This 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. American Indian Women. 3 Credits.
An examination of the historical and contemporary traditions, roles, contributions, and issues concerning Indian women. 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 republics of Indios, the persistence of Indios barbados 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.

ANAT 489. Senior Honors Thesis. 1-15 Credits.

ANAT 490. Directed Studies in Anatomy. 1-3 Credits.
Supervised studies and/or laboratory experiences in morphology. Repeatable to a maximum of 6 credits. Repeatable to 6 credits. F.S.SS.

ANAT 498. Internship in Anatomy. 1-15 Credits.
In-depth study and/or laboratory experiences in morphology in fields of faculty specialization. Prerequisites: Junior or Senior standing and instructor consent. Repeatable to 15 credits. F.S.SS.

Anthropology (Anth)

http://www.arts-sciences.und.edu/anthropology

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):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 170</td>
<td>Introduction to Biological Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 172</td>
<td>Introduction to Archaeology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 480</td>
<td>Senior Seminar</td>
<td>3</td>
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</table>

Method and Theory

Select one of the following (Cultural):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 350</td>
<td>Ethnographic Methods</td>
</tr>
<tr>
<td>ANTH 371</td>
<td>Cultural Dynamics</td>
</tr>
<tr>
<td>ANTH 372</td>
<td>Culture Theory</td>
</tr>
</tbody>
</table>

Select one of the following (Archaeology):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 300</td>
<td>Archaeological Laboratory Methods</td>
</tr>
<tr>
<td>ANTH 375</td>
<td>Women in Prehistory</td>
</tr>
<tr>
<td>ANTH 380</td>
<td>Field Techniques in Archaeology</td>
</tr>
<tr>
<td>ANTH 388</td>
<td>Method and Theory in Archaeology</td>
</tr>
<tr>
<td>ANTH 420</td>
<td>Archaeological Origins of Plant and Animal Use</td>
</tr>
<tr>
<td>ANTH 426</td>
<td>Lithic Technology</td>
</tr>
</tbody>
</table>

Select one of the following (Physical):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ANTH 325</td>
<td>Human Origins</td>
</tr>
<tr>
<td>ANTH 330</td>
<td>Human Variation</td>
</tr>
<tr>
<td>ANTH 335</td>
<td>Primates</td>
</tr>
<tr>
<td>ANTH 378</td>
<td>Physical Anthropology Method and Theory</td>
</tr>
<tr>
<td>ANTH 439</td>
<td>Human Osteology</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 170</td>
<td>Introduction to Biological Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
</tbody>
</table>
ANTH 172. Introduction to Archaeology  3
Select one of the following (Method and Theory):  3
  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 377. 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 it 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 evolutionary biology. 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 lifeway, 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 medico-legal 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 primate 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. 3-4 Credits.
An examination of the high civilizations of Latin America with focus on the
Aztec, Maya and Inca. Prerequisite: ANTH 172.
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. Prerequisite: ANTH 172 or consent of instructor. 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 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 lecturers 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, palaeopathology, 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, physical); 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.SS.

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 want 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,SS.

Art and Design

http://www.arts-sciences.und.edu/art-design

Fink, Ganje, Gonzalez-Smith, Herbert, Jones (Chair), Jonientz, 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, jewelry and metalsmithing, and fibers), digital time-based media, 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. ) B.F.A. with Major in Graphic Design and New Art Media (p. ) B.A. with Major in Visual Arts (p. )

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

II. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 604) for admission and licensing requirements.)

III. The program in Secondary Education, to include:

T&L 250 Introduction to Education 3
T&L 319 Inclusive Strategies 3
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 390 Special Topics 1-3
ART 461 Methods and Materials of Teaching Middle and Secondary School Art 3
T&L 432 Learning Environments 3
T&L 433 Multicultural Education 3
T&L 486 Field Experience 1
T&L 487 Student Teaching 16
T&L 488 Senior Seminar 1

Total Credits 43-45

* 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 B.F.A 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 department 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</th>
<th>Title</th>
<th>Credits</th>
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<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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</table>

Additional supportive courses

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<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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Studies in Studio Art outside emphasis area

Select a combination of the following to total 12 credits:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>200-level two-dimensional studio art courses</td>
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<td></td>
</tr>
<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>
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</tbody>
</table>

Studies in Art History

Select a combination of the following to total 6 credits:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 400-level art history course</td>
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<td></td>
</tr>
<tr>
<td>Any 400-level art history course</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Studies in Studio Art Emphasis Area

Select a combination of the following to total 24 credits:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
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</tr>
</tbody>
</table>

ART 494 Professional Exhibition 3

Art Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Any 300/400-level studio art or art history course</td>
<td>3</td>
<td></td>
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<tr>
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</table>

Exhibition Requirement

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<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>
</tbody>
</table>

Total Credits 60-99

* 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. 604) for admission and licensing requirements.)

III. The program in Secondary Education, to include:

T&L 250 Introduction to Education 3
T&L 319 Inclusive Strategies 3
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 390 Special Topics 1-3
ART 461 Methods and Materials of Teaching Middle and Secondary School Art 3
T&L 432 Learning Environments 3
T&L 433 Multicultural Education 3
T&L 486 Field Experience 1
T&L 487 Student Teaching 16
T&L 488 Senior Seminar 1

Total Credits 43-45

* 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 B.F.A 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 department 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</th>
<th>Title</th>
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</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>
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</tbody>
</table>

Additional supportive courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
</tr>
</tbody>
</table>

Studies in Studio Art outside emphasis area

Select a combination of the following to total 12 credits:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>200-level two-dimensional studio art courses</td>
<td>3-6</td>
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</tr>
<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>
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</tbody>
</table>

Studies in Art History

Select a combination of the following to total 6 credits:

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 400-level art history course</td>
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<td></td>
</tr>
<tr>
<td>Any 400-level art history course</td>
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</tbody>
</table>

Studies in Studio Art Emphasis Area

Select a combination of the following to total 24 credits:

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>200-level studio art courses</td>
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<td></td>
</tr>
<tr>
<td>300-level studio art courses</td>
<td>0-12</td>
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</tr>
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ART 494 Professional Exhibition 3

Art Electives

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Exhibition Requirement

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<td>Drawing II</td>
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Total Credits 60-99

* 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.
Required 21 credits including:

- College of Arts and Sciences
- Art History courses.

Distribution of those credits is as follows:

All BA degree majors in Art have a minimum requirement of 42 credits in Art.

### II. The Following Curriculum of 42 major credits:

- **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:

#### Core Requirements

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#### Additional Supportive Credits in Graphic Design and New Art Media (9 credits)

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<tr>
<td>ART 120</td>
<td>Introduction to Drawing and Color Materials</td>
<td>3</td>
</tr>
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<td>History of Art I</td>
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#### Exhibition Requirement

**Total Credits:** 78

- 9 credits from courses in drawing, painting, printmaking, photography, time-based media, sculpture, ceramics, fibers, or jewelry and metalsmithing
- All B.F.A. candidates are also required to produce a B.F.A. Exhibition with the approval of their faculty adviser and in conjunction with the ART 494 Professional Exhibition course.

### B.A. with Major in Visual 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).
- **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:

#### Core Requirements

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#### Exhibition Requirement

**Total Credits:** 78

- 9 credits from courses in drawing, painting, printmaking, photography, time-based media, sculpture, ceramics, fibers, or jewelry and metalsmithing
- All B.F.A. candidates are also required to produce a B.F.A. Exhibition with the approval of their faculty adviser and in conjunction with the ART 494 Professional Exhibition course.

### B.A. with Major in Visual Arts (Studio)

Required 21 credits including:

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<td>ART 112</td>
<td>Introduction to the Visual Arts</td>
<td>3</td>
</tr>
<tr>
<td>ART 130</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
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<td>Drawing II</td>
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#### 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.**
  Study and analysis of artistic methods and meaning in the visual arts. Films, original works, slides, discussions, demonstrations. Structure and meaning of visual art forms as revealed through the analysis of psychological applications of art media. 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.**
  An 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 120. Introduction to Drawing and Color Materials. 3 Credits.
Introduction for non-majors to drawing and color media and techniques. Includes working from still lifes, 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 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. Prerequisite: ART 220. 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 multiplecolor printing, experimental print processes, photoprinting, 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 computer-generated 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 photographic projects using color, black and white, 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. 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 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 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 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.

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/dept/artsci) for the appropriate A&S course request forms.

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:

GEOG 362 Geography of Canada 3
HIST 204 Canada to 1867 3
or HIST 205 Canada since 1867 3
A&S 252 Introduction to Canadian Studies 3

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.
FREN 307 A Social and Cultural History of Québec 3
FREN 373 North American Francophone Cultures through Literature and Film 3
FREN 494 Individual French Readings 1-3
HIST 300 Topics in History 1

Required Courses 9
Any combination of courses from the approved list (see below)

Native, total 11-12 hours
IS 250 Lakota Language I 3
IS 251 Lakota Languages II 3
IS 350 Native American Languages 3
IS 201 History of the Sioux 3
IS 203 History of the Anishinabe 3
ANTH 377 North American Archaeology 3
HIST 399 Selected Topics in History (when applicable) 2-3

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:

ANTH 377 North American Archaeology 3
A&S 251 Study in Canada 1-12
A&S 252 Introduction to Canadian Studies 3
IS 250 Lakota Language I 3
IS 251 Lakota Languages II 3
ENGL 367 American Indian Literatures 3
ENGL 415 Seminar in Literature 3
FREN 307 A Social and Cultural History of Québec 3
FREN 373 North American Francophone Cultures through Literature and Film 3
FREN 494 Individual French Readings 1-3
GEOG 262 Geography of North America I 3
GEOG 362 Geography of Canada 3
GEOG 462 Geography of North America II 3
HIST 204 Canada to 1867 3
HIST 205 Canada since 1867 3
HIST 300 Topics in History (History of Quebec) 1
HIST 300 Topics in History (History of the Canadian West) 1
HIST 300 Topics in History (History of the Canadian North) 1
HIST 399 Selected Topics in History (when applicable) 2-3
HIST 421 The British Empire, 1496-1884 3
HIST 422 The British Empire and Commonwealth, 1884-the Present 3
A&S 497. Internship. 1-3 Credits.
This internship is a short-term work experience emphasizing hands-on learning that is not covered by regular departmental offerings. e.g., Nonprofit Leadership, Studio One. For Nonprofit Leadership interns, work experience will incorporate education and professional development in a nonprofit agency. Studio One interns produce television news, weather, sports and entertainment segments and interviews. Prospective Studio One interns must apply one semester in advance. Studio One internships are closed to pre-communication and communication majors. Prerequisite: Permission of instructor and dean. Prerequisite or Corequisite: A&S 200. Repeatable to 3 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 as topics vary. Repeatable.

Athletic Training
(See Family Medicine (p. 128) listing)

Atmospheric Sciences (AtSc)
http://www.atmos.und.edu/
Askelson, Borho, Dong, 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. 612) 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-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).

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. 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. 593) listing.
III. The Following Curriculum:

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 200. Introduction to the Nonprofit Sector. 3 Credits.
An introduction to management and leadership in the nonprofit sector investigating the history, philosophy, ethics, and organization of nonprofit agencies. Coursework will include introductions on volunteerism, board selection and development, fundraising, the role of a foundation, management and administration, and public relations. The course will combine a review of texts, student research, expert guest lecturers, workshops, and student presentations. F.

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,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 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 450. Capstone Experience and Development for Nonprofit. 3 Credits.
This course provides a "culminating experience" pulling together learning that occurred in previous courses related to nonprofit leadership program goals. Students are REQUIRED to attend the Alliance Management Institute (AMI). The Alliance Management Institute is a 3-4 day, intensive national management institute, organized for students from across the country affiliated with the Nonprofit Leadership Alliance, featuring an opportunity for students to present, attend seminars and workshops, and participate in real world case studies with nonprofit organizations. The institute is held in early January, between the fall and spring semesters. Students are required to raise funds to cover travel expenses and registration fees (app. $800-$1,000), or pay their own expenses. Fund raising efforts provide a hands-on learning experience prior to the Institute. Students will be asked to develop an integrative paper describing their institute experience. In addition students will develop a competency portfolio conveying what they have learned from the nonprofit leadership program that will be presented as the final requirement for the program before they graduate. Prerequisite: A&S 200. S.
### Minor in Atmospheric Sciences

**Requirements:**
- 3 credits in Atmospheric Sciences Orientation
- 3 credits in Meteorology I
- 4 credits in Introduction to Synoptic Meteorology
- 3 credits in Introduction to Weather Forecasting
- 3 credits in Atmospheric Science Electives

**Total Credits:** 20

**Note:**
- Courses from other departments may be used as Career Electives.
- A maximum combined limit of 6 credit hours of ATSC 397 Cooperative Education, and ATSC 497 Internship, may be used as Career Electives.

### 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 266. F,S.

**ATSC 210L. Meteorology I Laboratory. 1 Credit.**
Laboratory to accompany ATSC 210. Corequisite: ATSC 210. F,S.

**ATSC 301. 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 302. 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/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. Prerequisite 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 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 Meteorology and consent of advisor. Repeatable to 3 credits. S/U grading. F,S,SS.

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

Archer, Basile, Bjerke (Chair), Bridewell, Carlson, Crawford, Daku, Dilse, Drechsel, Dusenbury, Foltz, Frazier, Higgs, Iseminger, Jensen, Jorgenson, Kenville, Kroeber, Lents, Liang, Lindseth, Lovelace, Malott, Martin, Robertson, Schroeder, Schuer, Schumacher, Smith, Snyder, Trapnell, Tucker, Ullrich, Vacek, Venuhuizen, Wild, Wilson and Zeidlik

The Department of Aviation offers seven different majors in two degree programs. The Bachelor of Business Administration degree may be earned in either Aviation Management or Airport Management, and is granted by the College of Business and Public Administration. The Bachelor of Science in Aeronautics may be earned in Commercial Aviation, Air Traffic Management, Flight Education, Aviation Technology Management, and Unmanned Aircraft Systems Operations, and is granted by the John D. Odgead School of Aerospace Sciences.
The Business degree is fully accredited by the American Assembly of Collegiate Schools of Business (AACSB). The Commercial Aviation and Air Traffic Management majors are fully accredited by the Aviation Accreditation Board International.

UND Aerospace Student Services, located in Odegard Hall, Room 259, is available to help students select their academic and career choices. In coordination with faculty advisors, they inform students of degree requirements, arrange meetings with industry professionals, and provide information regarding semester-long internship opportunities. Students may contact UND Aerospace Student Services at 1-800-258-1525, or by email at: fly.und@aero.und.edu (fly.und@aero.und.nodak).

Flight training in rotorcraft can replace fixed wing course requirements in the seven aviation majors and both minors. Students interested in this option should contact UND Aerospace Student Services.

Aviation Departmental Policies
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 259.

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."

Pre-Business Core courses
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 200</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ACCT 201</td>
<td>6</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ISBC 317</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ECON 202</td>
<td>9</td>
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<tr>
<td>&amp; ECON 210</td>
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</tbody>
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Further information on the business degree can be obtained by contacting the Office of Academic Advisement located in Gamble Hall, Room 127.

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) 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 to 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. For 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), fly.und@aero.und.nodak.edu Please refer to http://aviation.und.edu for more information on departmental and transfer policies.

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 a UND flight training course that requires 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, 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 particular curriculum. 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 the 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 within 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.

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.

The Unmanned Aircraft Systems Operations curriculum is offered to those students pursuing careers within the civil unmanned aircraft systems industry. The program provides the breadth and depth of instruction needed to prepare students for careers as control operators and team members of unmanned aircraft systems (UAS) while fully understanding the operational and safety environments of the National Airspace System. Courses require students to be comfortable utilizing complex science, technology, engineering and mathematics principles. In addition, students must possess strong critical thinking and problem-solving skills. A Commercial Pilot Certificate, with instrument and multi-engine ratings is required. As some of the technologies involved with UAS fall under export control laws, students...
wishing to pursue this degree program must be able to prove United States citizenship prior to enrolling in the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 238</td>
<td>UAS Operator Certification</td>
<td>3</td>
</tr>
<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>
</tr>
<tr>
<td>AVIT 333</td>
<td>UAS Remote Sensing</td>
<td>4</td>
</tr>
<tr>
<td>AVIT 334</td>
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<td>3</td>
</tr>
<tr>
<td>AVIT 438</td>
<td>UAS Operations</td>
<td>4</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 be from a 4-year institution) including:

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
</tr>
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<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>COMM 110</td>
<td>Fundamentals of Public Speaking</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>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>GEOL 103</td>
<td>Introduction to Environmental Issues</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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<tr>
<td>MATH 103</td>
<td>College Algebra</td>
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<td>POLS 115</td>
<td>American Government I</td>
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<td>Arts and Humanities Electives</td>
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Select one of the following:

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<th>Course</th>
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<tbody>
<tr>
<td>ANTH 171</td>
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</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
</tr>
<tr>
<td>SOC 110</td>
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Aviation Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIT 100</td>
<td>Aviation Orientation</td>
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<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>
<td>3</td>
</tr>
<tr>
<td>AVIT 250</td>
<td>Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>AVIT 311</td>
<td>Safety Management System (SMS)</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>
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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:

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

II. College of Business and Public Administration Requirements (see College section)

III. The following curriculum:

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<td>Introduction to Business and Economic Statistics</td>
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Aviation Courses

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<th>Title</th>
<th>Credits</th>
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<tr>
<td>ATSC 231</td>
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<tr>
<td>AVIT 100</td>
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</tr>
<tr>
<td>AVIT 102</td>
<td>Introduction to Aviation</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 103</td>
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</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>
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</tbody>
</table>
III. The following curriculum:

II. School of Aerospace Sciences Requirements (see College section).

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

which must be from a 4-year institution) including:

- Management
- B.S. in Aeronautics with a Major in Air Traffic
  Sciences
- John D. Odegard School of Aerospace
  Sciences

AVIT 222 IFR Regulations and Procedures 3
AVIT 250 Human Factors 2
AVIT 323 Aerodynamics - Airplanes 3
AVIT 324 Aircraft Systems 3
AVIT 325 Multi-Engine Systems and Procedures 2
AVIT 403 Aerospace Law 3
AVIT 485 Aviation Senior Capstone 3

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

ACCT 315 Business Law I 3
ECON 303 Money and Banking 3
FIN 310 Principles of Financial Management 3
MGMT 300 Principles of Management 3
MGMT 301 Operations Management 3
MGMT 302 Human Resource Management 3
or MGMT 310 Organizational Behavior
MGMT 475 Strategic Management 3
MRKT 305 Marketing Foundations 3

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

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
MATH 103 College Algebra 3
Fine Arts and Humanities Electives 9
Social Science Electives 9
Math, Science, and Technology Elective 2

Aviation Courses

AVIT 100 Aviation Orientation 1
AVIT 102 Introduction to Aviation 5
AVIT 103 Introduction to Air Traffic Control 2
AVIT 126 Introduction to UAS Operations 2
AVIT 208 Aviation Safety 3
AVIT 250 Human Factors 2
AVIT 260 Air Traffic Control: Tower Operations I 4
AVIT 261 Air Traffic Control: Radar Operations I 4
AVIT 362 Air Traffic Control: Advanced Tower Operations II 4
AVIT 363 Air Traffic Control: Radar Operations II 4
AVIT 402 Airport Planning and Administration 3

AVIT 403 Aerospace Law 3
AVIT 464 Air Traffic Control: Tower and Radar Operations III 4
AVIT 465 Air Traffic Control: Radar and Tower Operations IV 4
AVIT 468 Air Traffic Control: Non-Radar Procedures 4
AVIT 485 Aviation Senior Capstone 3

Other Requirements

COMM 212 Interpersonal Communication 3
MGMT 300 Principles of Management 3
or AVIT 311 Safety Management System (SMS)
or AVIT 312 Aircraft Accident Investigation

Select one of the following:

- ISBC 320 Professional Communication for Business
  or ENGL 227 Introduction to Literature and Culture
  or ENGL 228 Diversity in Global Literatures
  or ENGL 229 Diversity in U.S. Literatures
  or ENGL 308 The Art of Writing Nonfiction

Plus electives to total 125 credits. *

Total Credits 125

* Students will be required to use their electives to establish some expertise in a second field. Normally that will mean taking a formal minor or second major. Suggested fields include Communication, Computer Science, Economics, Foreign Language, Industrial Technology, Atmospheric Sciences, Office Administration, Political Science, Psychology and Public Administration.

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:

Aviation Requirements

AVIT 100 Aviation Orientation 1
AVIT 102 Introduction to Aviation 5
AVIT 103 Introduction to Air Traffic Control 2
AVIT 126 Introduction to UAS Operations 2
AVIT 208 Aviation Safety 3
AVIT 250 Human Factors 2
AVIT 260 Air Traffic Control: Tower Operations I 4
AVIT 261 Air Traffic Control: Radar Operations I 4
AVIT 362 Air Traffic Control: Advanced Tower Operations II 4
AVIT 363 Air Traffic Control: Radar Operations II 4
AVIT 402 Airport Planning and Administration 3

AVIT 4142 Introduction to Aviation-Helicopter
AVIT 4103 Introduction to Air Traffic Control
AVIT 4126 Introduction to UAS Operations
AVIT 208 Aviation Safety 3
AVIT 250 Human Factors 2
AVIT 403 Aerospace Law 3
AVIT 485 Aviation Senior Capstone 3
### 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:

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

II. School of Aerospace Sciences Requirements (see College section).

III. The following curriculum:

<table>
<thead>
<tr>
<th>Essential Studies Courses</th>
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<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
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<td>Meteorology I Laboratory</td>
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<td>Social Science Electives</td>
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<td>Math, Science, and Technology Elective</td>
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#### Aviation Core Courses

<table>
<thead>
<tr>
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Select two of the following:

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<td>AVIT 405</td>
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<td>AVIT 407</td>
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Other Requirements

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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ATSC 231</td>
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<td>or ENGL 228</td>
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<tr>
<td>or ENGL 229</td>
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<tr>
<td>or ENGL 308</td>
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<tr>
<td>or ISBC 320</td>
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### Required Courses - Airplane Option

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<tr>
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<tr>
<td>AVIT 102</td>
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<td>AVIT 221</td>
<td>3</td>
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<tr>
<td>AVIT 222</td>
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<td>AVIT 323</td>
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<td>AVIT 414</td>
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<td>AVIT 415</td>
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<td>AVIT 421</td>
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<td>AVIT 428</td>
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<td>AVIT 480</td>
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#### Required Courses - Helicopter Option

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AVIT 142</td>
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<td>AVIT 143</td>
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<td>AVIT 241</td>
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<td>AVIT 310</td>
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<td>AVIT 342</td>
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<td>AVIT 445</td>
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<td>one of the Following Courses for the Helicopter Option (1-5 Credits)</td>
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<td>AVIT 246</td>
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<td>AVIT 311</td>
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<td>AVIT 414</td>
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<td>AVIT 415</td>
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Plus electives to total 125 credits.

### B.S. in Aeronautics with a Major in Flight 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 Requirements (see University ES listing).

II. School of Aerospace Sciences Requirements (see College section).

III. The following curriculum:

<table>
<thead>
<tr>
<th>Essential Studies Courses</th>
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<tbody>
<tr>
<td>ATSC 110</td>
<td>Meteorology I</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<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 146</td>
<td>Applied Calculus I</td>
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<tr>
<td>Fine Arts and Humanities Electives</td>
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<tr>
<td>Social Science Electives</td>
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<td>Math, Science, and Technology Elective</td>
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#### Aviation Courses

<table>
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<tr>
<th>Course</th>
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<tr>
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<td>AVIT 208</td>
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<td>AVIT 221</td>
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Other Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ATSC 231</td>
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Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>ENGL 227</td>
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<td>or ENGL 228</td>
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<td>or ENGL 229</td>
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<td>or ENGL 308</td>
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<td>or ISBC 320</td>
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</tbody>
</table>
AVIT 222 IFR Regulations and Procedures 3
AVIT 250 Human Factors 2
AVIT 309 Flight Physiology 3
AVIT 323 Aerodynamics - Airplanes 3
AVIT 324 Aircraft Systems 3
AVIT 325 Multi-Engine Systems and Procedures 2
AVIT 403 Aerospace Law 3
AVIT 405 Airline Operations and Management 3
AVIT 407 General Aviation Operations and Management 3
AVIT 414 Certified Flight Instructor Certification 5
AVIT 415 Instrument Flight Instructor 4
AVIT 416 Multi-Engine Flight Instructor 2
AVIT 485 Aviation Senior Capstone 3
AVIT 490 Methods and Materials in Teaching Aviation I 2
AVIT 491 Methods and Materials in Teaching Aviation II 2

Other Requirements
T&L 250 Introduction to Education 3
T&L 345 Curriculum Development and Instruction 3
ATSC 231 Aviation Meteorology 4
ENTR 305 3

Select one of the following:
ENGL 227 Introduction to Literature and Culture 3
or ENGL 228 Diversity in Global Literatures
or ENGL 229 Diversity in U.S. Literatures
or ENGL 309 Modern Grammar
or ISBC 320 Professional Communication for Business

Plus electives to total 125 credits.

Total Credits 125

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
ATSC 110 Meteorology I 3
ATSC 110L Meteorology I Laboratory 1
COMM 110 Fundamentals of Public Speaking 3
CSCI 130 Introduction to Scientific Programming 4
OR
CSCI 160 Computer Science I 3
CSCI 290 Cyber-Security and Information Assurance 3
ENGL 110 College Composition I 3
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 146 Applied Calculus I 3
Fine Arts and Humanities Electives 9
Social Science Electives 9
Math, Science & Technology Electives

Aviation Courses
AVIT 100 Aviation Orientation 1
AVIT 102 Introduction to Aviation 5
AVIT 103 Introduction to Air Traffic Control 2
AVIT 126 Introduction to UAS Operations 2
AVIT 208 Aviation Safety 3
AVIT 221 Basic Attitude Instrument Flying 3
AVIT 222 IFR Regulations and Procedures 3
AVIT 238 UAS Operator Certification 3
AVIT 250 Human Factors 2
AVIT 323 Aerodynamics - Airplanes 3
AVIT 324 Aircraft Systems 3
AVIT 325 Multi-Engine Systems and Procedures 2
AVIT 327 Gas Turbine Engines 2
AVIT 331 UAS Flight Systems 3
AVIT 332 UAS Ground Systems 3
AVIT 333 UAS Remote Sensing 4
AVIT 403 Aerospace Law 3
AVIT 430 Crew Resource Management 3
AVIT 438 UAS Operations 4
AVIT 485 Aviation Senior Capstone 3

Other Requirements
ATSC 231 Aviation Meteorology 4
Select one of the following:
ENGL 227 Introduction to Literature and Culture 3
or ENGL 228 Diversity in Global Literatures
or ENGL 229 Diversity in U.S. Literatures
or ENGL 308 The Art of Writing Nonfiction
or ISBC 320 Professional Communication for Business

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:
ATSC 110 Meteorology I 3
ATSC 110L Meteorology I Laboratory 1
ATSC 231 Aviation Meteorology 4
AVIT 102 Introduction to Aviation 5
AVIT 208 Aviation Safety 3
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

Total Credits 30

Minor in Aviation Management

Required: 21 credits including:
ATSC 110 Meteorology I 3
ATSC 110L Meteorology I Laboratory 1
AVIT 101 Survey of Flight 5
or AVIT 102 Introduction to Aviation
AVIT 208 Aviation Safety 3
AVIT 402 Airport Planning and Administration 3
AVIT 403 Aerospace Law 3
AVIT 405 Airline Operations and Management 3
or AVIT 407 General Aviation Operations and Management

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:

- ENTR 305  
- ENTR 306  
- AVIT 311 Safety Management System (SMS)  
- AVIT 313 Aviation Insurance  
- AVIT 408 Fleet Planning and Aircraft Acquisition

Total Credits 16

**Safety Specialization**

Required Courses (17 credits) including:

- AVIT 311 Safety Management System (SMS)  
- AVIT 412 Aviation Safety Analysis  
- CSCI 290 Cyber-Security and Information Assurance  
- OSEH 395 Hazardous Materials Management  
- OSEH 435 Risk Management  
- TECH 440 Occupational Safety

Total Credits 17

**Optional Courses (available with department approval)**

- AVIT 312 Aircraft Accident Investigation  
- AVIT 313 Aviation Insurance

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 glass 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 Flight Decks). 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 200. 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 skill 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, plus 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 246. Helicopter Turbine Transition. 1 Credit.**
This course provides the training necessary to operate a turbine helicopter as pilot-in-command, including flight experience in a turbine powered helicopter. Prerequisite or Corequisite: AVIT 241 and a minimum GPA of 2.5. 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 206 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 or AVIT 324; open to Aviation majors and minors only; minimum GPA of 2.5. Corequisite: AVIT 324, 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: AVIT 222; open to Aviation majors and minors only; minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 323, 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 234; 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,SS.

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 142 and a minimum GPA of 2.5. Prerequisite or Corequisite: AVIT 241. 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 385. Seaplane Certification. 1 Credit.
The seaplane certification course includes all the necessary classroom and flight instruction for the student to acquire the skill, knowledge, and experience for obtaining a seaplane rating on his/her Private or Commercial Pilot Certificate. The course will include, but not be limited to, normal takeoffs, porpoising and skipping, water emergency takeoffs and landings, taxiing, sailing and docking, glassy water operations, cross-wind, rough water, and confined area takeoffs and landings, and the general care and operation of a seaplane. Prerequisite: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.5. S/U grading. F,S,SS.

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,S,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,S,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,S,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 243 or AVIT 325, and MATH 146; open to aviation majors and minors only; minimum GPA of 2.5. F,S.
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: fundamental of teaching and learning, including effective teaching methods and 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 or consent of the instructor; 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, "followship," 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.

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, AVIT 334, 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 agricultural, tie-line, offshore and night vision goggle operations. Prerequisite: AVIT 241 and a 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 comprehensive 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.

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 or 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. 107) 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 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.

BMB 494. Directed Studies. 1-4 Credits.
A course designed to provide individual students with the opportunity for creative, scholarly, and research activities in Biochemistry and Molecular Biology under the direction of a departmental faculty member. Repeatable to 12 credits. F, S, SS.

Biology (Biol)
http://www.arts-sciences.und.edu/biology
Boulauger, Carmichael, Darby, D. Darland, T. Darland, Ellis-Felege, Goodwin (Chair), Kelsch, Manu, Meberg, Newman, Ovtchinnikov, Pyle, Ralph, Rhen, Schlisser, Sheridan, Simmons, Tkach, Vaughan, and Yuskonis

The Biology Department's program provides a well-rounded, balanced 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 program include: critical and creative thinking, quantitative reasoning, written and oral communication, and information literacy.

Our philosophy is that a university education should emphasize both formal classroom instruction and individual research experiences for highly motivated students. Class instruction benefits from having enthusiastic faculty scholars working at the forefront of their disciplines. Faculty research benefits from having enthusiastic undergraduate students integrally involved in faculty research projects.

Facilities
The Department of Biology is housed in Starcher Hall. In addition to classrooms, computer laboratories and other specialized teaching laboratories, the building houses a herbarium, three greenhouses, environmental chambers, animal rooms for terrestrial and aquatic organisms, observation rooms, vertebrate and invertebrate museums, tissue culture facilities, a biology core molecular facility, and more than 2,000 square feet of shared flexible research space. The Department also maintains three field stations which cover more than 1,500 acres and represent a range of natural and working landscapes in North Dakota.

Independent Study, Research Opportunities, and the Honors Program
Well-qualified Biology majors are urged to participate in independent studies, undergraduate research, or honors work. Normally, independent studies and research are initiated by invitation from a faculty member. Students selected for these programs usually carry out their studies in the research laboratories of the individual professors. Research apprenticeships or assistantships financed by private foundation support or faculty research grants may be available for part-time employment. The Department participates in the University Honors Program through certain interdisciplinary colloquia, by honors credit in advanced courses, and by independent studies and tutorials in advanced topics.
College of Arts and Sciences Degree
Programs and Options

B.S. with Major in Biology (Three Options)

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>
</tbody>
</table>

Total Credits 9

II. 44 major hours including:

A. Core requirements for each option (24 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>General Biology II</td>
<td>2</td>
</tr>
<tr>
<td>&amp; BIOL 150L</td>
<td>General Biology I Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>&amp; BIOL 151L</td>
<td>General Biology II Laboratory</td>
<td>2</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 earn a grade of "B" or higher in both of those courses prior to becoming a 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 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 Anatomy for Paramedical Personnel
    - ANTH 335 Primates
    - ANTH 325 Human Origins
    - BMB 401 Biochemistry of Proteins and Information Flow
    - BMB 403 Advanced Biochemistry Laboratory
    - MBIO 302 General Microbiology Lecture
    - MBIO 302L 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 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):
Advanced requirements (minimum 20 credit hours):

Consult with their adviser to develop an appropriate course of study.

This program will help prepare students for careers with ecological and evolutionary analytical skills and familiarity with the major groups of living organisms. The coursework outlined here will familiarize students with the conceptual framework of ecology and evolutionary biology and provide necessary evolutionary history and interactions of organisms and their environments.

**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, ecology, evolutionary history and interactions of organisms and their environments. 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):

### Required courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 341L</td>
<td>Cell Biol Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 410</td>
<td>Molecular Biology Techniques</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 378</td>
<td>Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 415</td>
<td>Genomics</td>
<td>4</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 315R</td>
<td>Genetics Recitation</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 369</td>
<td>Histology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 369L</td>
<td>Histology Lab</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 390</td>
<td>Endocrinology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 450</td>
<td>Molecular Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 460</td>
<td>Molecular Biology of the Cell</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 302</td>
<td>General Microbiology Lecture</td>
<td>3</td>
</tr>
<tr>
<td>BMB 401</td>
<td>Biochemistry of Proteins and Information Flow</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.

### Biology electives

**3**

### 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 &amp; 134L Introduction to Global Climate Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 471</td>
<td>Cartography and Visualization &amp; 471L Cartography and Visualization Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Geographic Information Systems (GIS) &amp; 474L Introduction to Geographic Information Systems (GIS)</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology &amp; 101L Introduction to Geology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 102</td>
<td>The Earth Through Time &amp; 102L The Earth Through Time Laboratory</td>
<td>3</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.

### Mathematics

**3-4**

**Chemistry**

### General Chemistry

- CHEM 121 General Chemistry I
- & 121L General Chemistry I Laboratory
- & CHEM 122 General Chemistry II
- & CHEM 122L General Chemistry II Laboratory

**OR**

- CHEM 221 Fundamentals of Chemistry - Concepts
- & 221L Fundamentals of Chemistry Laboratory
- & CHEM 254 Organic Chemistry I
- & CHEM 254L Organic Chemistry I Laboratory

### Organic Chemistry


**OR**


**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:

- BIOL 470 Biometry
- SOC 326 Sociological Statistics
- MATH 321 Applied Statistical Methods

### 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, is 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. 238) 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:

- BIOL 312 Evolution 3
- BIOL 336 Systematic Botany 4
- MBIO 302 General Microbiology Lecture & 302L General Microbiology Laboratory 4

These students must also complete at least four credit hours of earth science from the following:

- GEOL 101 Introduction to Geology 4
- GEOL 101L and Introduction to Geology Laboratory 4
- GEOG 121 Global Physical Environment 4
- GEOG 121L and Global Physical Environment Laboratory 4
- GEOG 134 Introduction to Global Climate 4
- GEOG 134L and Introduction to Global Climate Laboratory 4

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.

- CHEM 340 Survey of Organic Chemistry 5
- CHEM 340L and Survey of Organic Chemistry Laboratory 5
- BMB 301 Biochemistry 3

Students interested in certification in both Biology and Physics should take

- PHYS 211 College Physics I (lab included) 4
- PHYS 212 College Physics II (lab included) 4
- PHYS 213 College Physics III (lab included) 4

Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 250 Introduction to Education (see Department of Teaching and Learning (p. 238) listing). Biology majors seeking secondary certification must have an adviser both in the Biology Department and in the Department of Teaching and Learning.

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:

- ENGL 110 College Composition I 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- COMM 110 Fundamentals of Public Speaking 3

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 (24 hours), all courses below:

- BIOL 120 Orientation to the Biology Major 1
- BIOL 150 General Biology I & BIOL 151 and General Biology II 6
- BIOL 150L General Biology I Laboratory & BIOL 151L and General Biology II Laboratory 2
- 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 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:

- The following courses qualify: 332L. General Ecology Laboratory; 336L. Systematic Botany; 341L. Cell Biology Laboratory; 363L. Entomology; 364L. Parasitology Laboratory; 369L. Histology Laboratory; 376L. Animal Biology Laboratory; 378L. Developmental Biology Lab; 410. Molecular Biology Techniques; 415L. Genomics; 416L. Ecological Genomics; 418L. Systems Biology; 425L. Ichthyology; 426L. Birds and Mammals; 431L. Wildlife Management; 438L. Fisheries Management; 442L. Physiology of Organs and Systems Laboratory.

- 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 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 General Microbiology Lecture 4
  - MBIO 328 Introduction to Immunology 3
  - PPT 301 Human Physiology 4

- MBIO 301 Biochemistry will not be allowed
- MBIO 202 Introductory Medical Microbiology Lecture/MBIO 202L Introductory Medical Microbiology Laboratory only will 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 toward 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):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 341L</td>
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<td>BIOL 378</td>
<td>Developmental Biology</td>
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<tr>
<td>BIOL 378L</td>
<td>Developmental Biology Lab</td>
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<td>BIOL 410</td>
<td>Molecular Biology Techniques</td>
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<td>BIOL 415</td>
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<td>BIOL 416</td>
<td>Ecological Genomics</td>
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<td>BIOL 418</td>
<td>Systems Biology</td>
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<tr>
<td>BIOL 442</td>
<td>Physiology of Organs and Systems</td>
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<tr>
<td>BIOL 442L</td>
<td>Physiology of Organs and Systems Laboratory</td>
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**Total Credits: 24**

III. Cognate requirements in other departments:

A. Basic Life Science Option (30-36 credit hours):

**Mathematics**

<table>
<thead>
<tr>
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<th>Course Name</th>
<th>Credits</th>
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<tbody>
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<td>or MATH 165</td>
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**Chemistry and Biochemistry**

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<th>Course Name</th>
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<td>&amp; CHEM 122</td>
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<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
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<td>OR</td>
<td></td>
<td></td>
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<tr>
<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts</td>
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<td>&amp; 221L</td>
<td>and Fundamentals of Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 254</td>
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<tr>
<td>&amp; CHEM 254L</td>
<td>and Inorganic Chemistry I Laboratory #</td>
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**Organic Chemistry**

<table>
<thead>
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<th>Course Name</th>
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<tbody>
<tr>
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<td>and Survey of Organic Chemistry Laboratory</td>
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<td>OR</td>
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<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I</td>
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<td>&amp; 341L</td>
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<td>OR</td>
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<tr>
<td>CHEM 341</td>
<td>Organic Chemistry I</td>
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<tr>
<td>&amp; 341L</td>
<td>and Organic Chemistry I Laboratory</td>
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<tr>
<td>&amp; CHEM 342</td>
<td>and Organic Chemistry II</td>
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<tr>
<td>&amp; CHEM 342L</td>
<td>and Organic Chemistry II Laboratory ***</td>
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**Biochemistry**

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<td>MBIO 301</td>
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**Physical Sciences**

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<tr>
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<tr>
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<td>and College Physics II</td>
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<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
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<tr>
<td>&amp; PHYS 252</td>
<td>and University Physics II</td>
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**Statistical Methods and Data Interpretation**

Select one of the following:

<table>
<thead>
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<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 470</td>
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<td>SOC 326</td>
<td>Sociological Statistics</td>
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<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
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</tbody>
</table>

- Students with a particular aptitude for mathematics should consider taking both 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: Basic Life Science Option requires 117-123 total credit hours.

B. Enhanced Applied Life Science Option (45 - 51 credit hours):

**Mathematics**

<table>
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</thead>
<tbody>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
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</tr>
<tr>
<td>or MATH 165</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

**Chemistry, Biochemistry, Immunology, and Microbiology**

**General Chemistry**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
<td></td>
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<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II</td>
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</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
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<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts</td>
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</tr>
<tr>
<td>&amp; 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 and Analytical Chemistry**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 340</td>
<td>Survey of Organic Chemistry</td>
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<tr>
<td>&amp; 340L</td>
<td>and Survey of Organic Chemistry Laboratory</td>
<td></td>
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<tr>
<td>OR</td>
<td></td>
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</tr>
</tbody>
</table>
and regional biotech corporations early in their program of study regarding the industry are highly competitive. Students are encouraged to engage faculty.

Note: Summer research opportunities in faculty labs and the biotechnology research internship in the laboratories of UND faculty associated with either the Molecular and Integrative Life Science program or the School of Medicine and Biomedical Sciences.

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:

ENTR 250 Imagination, Creativity and Entrepreneurial Thinking 3
ENTR 290 Venture Initiation 3

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 requirement: (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</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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</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>
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<tr>
<td>Total Credits</td>
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<td>9</td>
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</table>

II. 44 major hours including:

A. Core requirements or each option (24 credit hours), all courses below:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
<td>1</td>
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<tr>
<td>&amp; BIOL 150</td>
<td>General Biology I</td>
<td>6</td>
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<tr>
<td>&amp; BIOL 151</td>
<td>General Biology II</td>
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<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory</td>
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<tr>
<td>&amp; BIOL 151L</td>
<td>General Biology II Laboratory</td>
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<tr>
<td>BIOL 312</td>
<td>Evolution</td>
<td>3</td>
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<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>
<tr>
<td>Total Credits</td>
<td></td>
<td>24</td>
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</tbody>
</table>

* 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:

  **ANAT 204 & 204L** Anatomy for Paramedical Personnel and Anatomy for Paramedical Personnel Laboratory 5
  **ANTH 325** Human Origins 3
  **ANTH 335** Primates 3
  **BMB 403** Biochemistry of Proteins and Information Flow 3
  **BMB 401** Advanced Biochemistry Laboratory 2
  **MBIO 302** General Microbiology Lecture & 302L and General Microbiology Laboratory 4
  **MBIO 328** Introduction to Immunology 3
  **PPT 304** Human Physiology 4
- **BMB 301** Biochemistry will not be allowed
- **BMB 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 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 (minimum 20 credit hours):

Select minimum 12 credit hours of the following (Upper-Level Courses):

**BIOL 341L** Cell Biol Lab
**BIOL 364** Parasitology

**BIOL 364L** Parasitology Laboratory
**BIOL 369** Histology
**BIOL 369L** Histology Lab
**BIOL 376** Animal Biology
**BIOL 376L** Animal Biology Laboratory
**BIOL 378** Developmental Biology
**BIOL 378L** Developmental Biology Lab
**BIOL 390** Endocrinology
**BIOL 418** Systems Biology
**BIOL 420** Neuroscience
**BIOL 442** Physiology of Organs and Systems
**BIOL 442L** Physiology of Organs and Systems Laboratory
**BIOL 415** Genomics
**BIOL 450** Molecular Genetics
**BIOL 460** Molecular Biology of the Cell
**MBIO 328** Introduction to Immunology

**BIology Electives** 8

**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.

III. Cognate requirements in other departments (30-33 credit hours):

**Mathematics**

<table>
<thead>
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 146</td>
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<tr>
<td>or MATH 165</td>
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**Chemistry**

**General Chemistry**

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<tbody>
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**OR**

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<td>&amp; CHEM 254</td>
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**Organic Chemistry**

<table>
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<td>&amp; BMB 301</td>
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**OR**

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<td>&amp; 341L</td>
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<td>&amp; BMB 301</td>
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**Physical Sciences**

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**OR**

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**Statistical Methods and Data Interpretation**

Select one of the following:

<table>
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<th>Course</th>
<th>Credits</th>
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<tbody>
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<td>BIOL 470</td>
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<td>PSYC 241</td>
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<tr>
<td>SOC 326</td>
<td></td>
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<tr>
<td>MATH 321</td>
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</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:

- **ENGL 110** College Composition I 3
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **COMM 110** Fundamentals of Public Speaking 3

Total Credits 9

II. The following curriculum:

56-58 major hours, including:

**Basic Courses**

- **BIOL 121** Introduction to Fisheries and Wildlife Biology 1
- **BIOL 150 & BIOL 151** General Biology I and General Biology II 6
- **BIOL 150L & BIOL 151L** General Biology I Laboratory and General Biology II Laboratory 2
- **BIOL 312** Evolution 3
- **BIOL 315** Genetics 3
- **BIOL 332 & 332L** General Ecology and Gen Ecology Lab 4
- **BIOL 481** Fisheries & Wildlife Senior Capstone ** 3

**Advanced Courses**

**Required**

- **BIOL 333** Population Biology 3
- **BIOL 336** Systematic Botany 4
- **BIOL 396** Fisheries and Wildlife Biology Pre-Internship Seminar 1
- **BIOL 397** Cooperative Education 1
- **BIOL 439** Conservation Biology 3
- **BIOL 470** Biometry 3

Select at least two of the following management courses: 6-8

- **BIOL 430** Human Dimensions of Wildlife and Fisheries 3
- **BIOL 431** Wildlife Management 3
- **BIOL 432** Techniques in Wildlife Population Assessment 3
- **BIOL 438** Fisheries Management 3

**Electives**

Select minimum of 12 hours of the following: ***

- **BIOL 338** Animal Behavior 3
- **BIOL 350** Plant Biology 3

**Total Credits** 64-66

- 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.

- **Total Credits** 80

- **Total Credits** 64-66

**Minor in Biology (minimum 20 hours required)**

Required 20 hours, including:

- **BIOL 150 & BIOL 151** General Biology I and General Biology II 6
- **BIOL 150L & BIOL 151L** General Biology I Laboratory and General Biology II Laboratory 2
- **BIOL 315** Genetics 3
- **BIOL 312** Evolution 3
- **BIOL 332** General Ecology 3
- **BIOL 336** Systematic Botany 4
- **BIOL 396** Fisheries and Wildlife Biology Pre-Internship Seminar 1
- **BIOL 397** Cooperative Education 1
- **BIOL 439** Conservation Biology 3
- **BIOL 470** Biometry 3
- **BIOL 431** Wildlife Management 3
- **BIOL 432** Techniques in Wildlife Population Assessment 3
- **BIOL 438** Fisheries Management 3
- **BIOL 338** Animal Behavior 3
- **BIOL 350** Plant Biology 3
- **BIOL 360** Soil Ecology 3

**Total Credits** 20

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 124. Environmental Science. 2 Credits.
A study of the effect of human activity upon the environment in which we live. 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.

BIOL 312R. Evolution Recitation. 1 Credit.
Students use computer simulations and case studies to explore concepts given in Biology 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 biochemical 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 322. 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 322L. Gen Ecology Lab. 1 Credit.
Field projects and laboratory exercises to complement BIOL 322. Counts as an upper-division laboratory course. Prerequisites: BIOL 150, BIOL 150L, BIOL 151, and BIOL 151L. Prerequisite or Corequisite: BIOL 322. 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 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. Prerequisite or Corequisite: BIOL 364. F, odd years.

BIOL 369. Histology. 2 Credits.
Microscopic 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, BIOL 315 and BIOL 341. F.

BIOL 378L. Developmental Biology Lab. 1 Credit.
Developmental Biology Lab is a one-credit class designed to complement the Developmental Biology Course (BIOL378). 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 transmittible 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 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 senior 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, 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.

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.
Biology

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 436. 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, 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 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 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 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.

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 489. 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.

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACCT 380</td>
<td>International Accounting</td>
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<tr>
<td>ECON 338</td>
<td>International Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 438</td>
<td>International Money and Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 430</td>
<td>International Financial Management</td>
<td>3</td>
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<tr>
<td>MGMT 420</td>
<td>Multinational Management</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 325</td>
<td>International Marketing</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>GEG 161</td>
<td>World Regional Geography</td>
<td>3</td>
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<tr>
<td>HIST 102</td>
<td>Western Civilization II</td>
<td>3</td>
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<tr>
<td>POLS 220</td>
<td>International Politics</td>
<td>3</td>
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<td>POLS 225</td>
<td>Comparative Politics</td>
<td>3</td>
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<tr>
<td>MRKT 325</td>
<td>International Marketing</td>
<td>3</td>
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</tbody>
</table>

Completion of Level II Proficiency in a language (8 hours) or approved study abroad (6 hours).
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 or 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:

University of North Dakota 83
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)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BADM 316</td>
<td>Introduction to Business in China</td>
<td>3</td>
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<tr>
<td>BADM 318</td>
<td>China Then and Now</td>
<td>6</td>
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<tr>
<td>&amp; BADM 319 &amp; or BADM 497</td>
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<td>&amp; BADM 319 &amp; or BADM 497</td>
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<td>&amp; BADM 318 &amp; or BADM 497</td>
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<td>&amp; BADM 316 &amp; or BADM 497</td>
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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 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 opportunities; 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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>SPRT 205</td>
<td>Introduction to Sport Business</td>
<td>3</td>
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<tr>
<td>SPRT 320</td>
<td>Sport Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>SPRT 330</td>
<td>Sport Law</td>
<td>3</td>
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<tr>
<td>SPRT 395</td>
<td>Special Topics in Sport Business</td>
<td>3</td>
</tr>
<tr>
<td>SPRT 440</td>
<td>Sport Branding and Sponsorship</td>
<td>3</td>
</tr>
<tr>
<td>SPRT 450</td>
<td>Facility and Event Planning</td>
<td>3</td>
</tr>
<tr>
<td>SPRT 497</td>
<td>Internship in Sport Business</td>
<td>3</td>
</tr>
<tr>
<td>or SPRT 397</td>
<td>Cooperative Education in Sport Business</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 21

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. Prerequisites: 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 9 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 497. 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.
To help meet our primary objective, the department has established program students, provide training for our students on how to succeed as researchers. Medicine, law and business. Research and professional activities by members careers. The prescribed curriculum provides a sound, technically based general paper, and environmental protection. They may be engaged in research, positions in a wide range of industries. These include not only traditional so that, upon graduation, they are prepared to take challenging entry-level

The department's primary objective is the education of undergraduate students (Chair)

Chemical Engineering (ChE)

http://engineering.und.edu/chemical

Alshami, 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 medicine, law and business. Research and professional activities by members of the faculty, conducted in collaboration with graduate and undergraduate students, provide training for our students on how to succeed as researchers.

To help meet our primary objective, the department has established program educational objectives that describe the expectations for our graduates. Graduates of the UND Chemical Engineering program will:

- Be highly competent in conducting the assignments and activities associated with their chosen career path.
- Attain promotions and/or accept responsibilities beyond their entry-level position in the chemical process and broadly related industries or be pursuing advanced degrees.
- Continue to develop professionally.
- Work effectively in teams and as leaders to solve problems and clearly communicate results.
- Act with integrity and consider the safety, sustainability, and social consequences of their decisions and activities.

The core of the program is a strong technical curriculum, whereby the fundamentals of the physical sciences, mathematics, and chemical 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. Six of the required technical courses are electives, which provide each student the opportunity to tailor the program to her/his individual interests such as environmental concerns, materials, bio-processes, 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 skills such as computer use, oral and written communication, and teamwork. The undergraduate program culminates in a senior capstone design course in which students bring together all they have learned as they work in teams on a process design and evaluation project. UND’s program is accredited by the Engineering Accreditation Commission (EAC) of ABET.

Practical, hands-on experience is gained in laboratories distributed throughout the undergraduate program. Lab experiments form a significant part of each student’s learning beginning immediately in first year chemistry and continuing through 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 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. 607) section for additional details. For even more complete information, see School of Graduate Studies (p. 612) section.

College of Engineering and Mines

B.S. in Chemical Engineering

Required 133 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 221</td>
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<tr>
<td>MATH 165</td>
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<tr>
<td>Calculus I</td>
<td>4</td>
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</tbody>
</table>

Credits: 17
### 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 in energetics, 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 requirements for the B.S. in Chemical Engineering. Requirements for the concentration are fulfilled by taking the following courses to meet the requirements for the B.S. in Chemical Engineering.

#### Select one of the following (Social Electives):
- ANTH 171 Introduction to Cultural Anthropology
- COMM 103 Information, Technology and Social Change
- CJ 201 Introduction to Criminal Justice
- ENGR 410 Technology Ventures
- GEOG 161 World Regional Geography
- ME 370 Engineering Disasters and Ethics
- PHIL 130 Introduction to Political Philosophy
- POLS 220 International Politics
- POLS 225 Comparative Politics
- SOC 115 Social Problems

Other as approved by department

#### Technical Elective I:
- CHE 530 Combustion Theory and Modeling

#### Technical Elective II:
- CHE 531 Rocket Propulsion

#### Advanced Chemical Science Electives:
- CHE 532 Explosives: Theory and Modeling

Select one of the following:
- CHE 435 Materials and Corrosion
- CHE 525 Polymer Engineering
- CHE 422 Capstone in Energetics

#### Total Credits

The student’s transcript will be marked by a Concentration in Energetics upon completion of the recommended curriculum.
Concentration in Sustainable Energy Engineering

Climate change, rising energy costs, and energy security represent some of the most significant issues facing today’s society. It will take major advances in technology to help resolve these issues. More importantly, energy-related issues have created a new industry with a strong need for the training and development of human capital. The concentration in Sustainable Energy Engineering is designed to help students prepare themselves for careers associated with sustainable energy technologies.

To qualify for a Concentration in Sustainable Energy 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 420 Capstone in Sustainable Energy.

Engineering Science Elective:
CHE 435 Materials and Corrosion 3
Select one of the following (Technical Elective I): 3
- ENGR 501 Energy, Resources and Policy
- ENGR 502 Alternative Energy Systems
EE 522 Renewable Energy Systems 3
Select one of the following (Technical Elective II): 3
- GEOL 103 Introduction to Environmental Issues
- GEOG 121 Global Physical Environment & 121L Global Physical Environment Laboratory
- GEOG 134 & 134L Introduction to Global Climate & Introduction to Global Climate Laboratory
Select one of the following (Advanced Chemical Science Elective):
- CHEM 333 & 333L Analytical Chemistry and Analytical Chemistry Laboratory
- CHE 493A Special Topics (Research)
Capstone:
CHE 420 Capstone in Sustainable Energy 1

Total Credits: 19

The student’s transcript will be marked by a Concentration in Petroleum Engineering upon completion of the recommended curriculum.

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.

Technical Elective II
PTRE 461 Natural Gas Engineering 3
GEOL 407 Petroleum Geology 3
Select one of the following (Business/Entrepreneurship Elective): 3
- PTRE 441 Petroleum Evaluation & Management
- CE 444 Contracts and Specifications
Capstone

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. Prerequisite: CHE 201. 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 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 CHEM 315. 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. 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 pressurevolume-temperature relationships. Prerequisites: CHE 201 with a grade of C or better. 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. Prerequisite or Corequisite: MATH 266. S.

CHE 315. Statistics and Numerical Methods in Engineering. 3 Credits.
Numerical methods include integration, differentiation, Taylor series expansion, curve fitting, linear and nonlinear regression. Statistical analyses of data include hypothesis testing, confidence intervals, tests for equal variances, analysis of variance, propagation of error, and an introduction to statistical design of experiments. Prerequisite or Corequisite: MATH 265. 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. 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. F.

CHE 332. Chemical Engineering Laboratory III. 2 Credits.
Experiments reinforcing physico-chemical principles, unit operations, and separations. Pre-design labs are also introduced. Prerequisite: CHE 331. 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. 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. F,S,SS.

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 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. 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. 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. Prerequisite: CHE 408 and C or better in CHE 411. 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. 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. Prerequisite: CHE 413. SS.

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. 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. F.

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,S,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,S,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. 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. Abrahamson, J., Chu, Delhomelle, Du, Hightower, Hoffmann, Kozlik, Kubatova, Novikov, Pierce (Chair), Smoliakova, 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. 238) requirements in Secondary Education. Students seeking certification must also complete these additional courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BMB 301</td>
<td>Biomedical Chemistry 3</td>
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<tr>
<td>BIOL 150</td>
<td>General Biology I 6</td>
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<tr>
<td>&amp; BIOL 151</td>
<td>and General Biology II</td>
</tr>
<tr>
<td>BIOL 150L</td>
<td>General Biology I Laboratory 2</td>
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<tr>
<td>&amp; BIOL 151L</td>
<td>and General Biology II Laboratory</td>
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<td>Select one of the following:</td>
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<td>GEOL 101</td>
<td>Introduction to Geology 4</td>
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<td>&amp; 101L</td>
<td>and Introduction to Geology Laboratory</td>
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<tr>
<td>GEOG 121</td>
<td>Global Physical Environment and Global Physical Environment Laboratory 4</td>
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<tr>
<td>Total Credits</td>
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Chemistry majors seeking secondary certification must have an advisor 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. 238) 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. )

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:

<table>
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<th>Freshman Year</th>
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<tr>
<td>First Semester</td>
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<tr>
<td>CHEM 101</td>
<td>Orientation to Chemistry 1</td>
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<td>CHEM 221</td>
<td>Fundamentals of Chemistry - Concepts 4</td>
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<td>&amp; 221L</td>
<td>and Fundamentals of Chemistry Laboratory</td>
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<td>ENGL 110</td>
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<td>Essential Studies and Other Electives</td>
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<tr>
<td>CHEM 254</td>
<td>Inorganic Chemistry I 4</td>
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<td>&amp; 254L</td>
<td>and Inorganic Chemistry I Laboratory</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences 3</td>
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<tr>
<td>MATH 166</td>
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Sophomore Year

First Semester

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<td>CHEM 341</td>
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<td>&amp; 341L</td>
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<tr>
<td>CHEM 361</td>
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<td>PHYS 251</td>
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<tr>
<td>MATH 265</td>
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<tr>
<td>Essential Studies and Other Electives 2</td>
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<td>Credits</td>
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Second Semester

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<tr>
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<td>CHEM 362</td>
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<td>PHYS 252</td>
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Junior Year

First Semester

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<td>CHEM 454</td>
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<td>&amp; 454L</td>
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<td>CHEM 466</td>
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<td>CHEM 443</td>
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<td>First Semester of a Foreign Language 5</td>
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<td>Essential Studies and Other Electives 2,4</td>
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Second Semester

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<td>CHEM 471R</td>
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<td>BMB 301</td>
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<tr>
<td>Second Semester of a Foreign Language 5</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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Senior Year

First Semester

<table>
<thead>
<tr>
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<tbody>
<tr>
<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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Second Semester

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CHEM 442</td>
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<tr>
<td>CHEM 488</td>
</tr>
<tr>
<td>CHEM 492</td>
</tr>
<tr>
<td>Essential Studies and Other Electives 4</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, 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

Freshman Year
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 101</td>
<td>1</td>
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<tr>
<td>CHEM 121</td>
<td>4</td>
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<tr>
<td>ENGL 110</td>
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<tr>
<td>MATH 165</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<td><strong>Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 122</td>
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<tr>
<td>MATH 166</td>
<td>4</td>
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<tr>
<td>ENGL 130</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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<td><strong>Credits</strong></td>
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Sophomore Year
First Semester

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 333</td>
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<tr>
<td>CHEM 341</td>
<td>4</td>
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<tr>
<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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Second Semester

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 342</td>
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<td>CHEM 362</td>
<td>1</td>
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<td>PHYS 252</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies and Other Electives</td>
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Junior Year
First Semester

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<tr>
<th>Course</th>
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<tr>
<td>CHEM 443</td>
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<tr>
<td>CHEM 466</td>
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<td>Essential Studies and Other Electives</td>
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Second Semester

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>CHEM 441</td>
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<td>CHEM 471</td>
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<td>CHEM 471R</td>
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<td>Essential Studies and Other Electives</td>
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<tr>
<td><strong>Credits</strong></td>
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Senior Year
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 462</td>
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<td>Essential Studies and Other Electives</td>
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<td><strong>Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 442</td>
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<td>CHEM 492</td>
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<td>Essential Studies and Other Electives</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.

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 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
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 101</td>
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<tr>
<td>CHEM 121</td>
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<td>ENGL 130</td>
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<tr>
<td>MATH 165</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies and Other Electives</td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 122</td>
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<tr>
<td>MATH 166</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies and Other Electives</td>
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</tr>
<tr>
<td><strong>Credits</strong></td>
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</table>

Total Credits 15
MATH 146 Applied Calculus I  
BIOL 151 General Biology II and General Biology II Laboratory  
ENGL 130 Composition II: Writing for Public Audiences  
Essential Studies Electives  

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>17</td>
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**Sophomore Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 333 Analytical Chemistry</td>
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<tr>
<td>CHEM 341 Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 361 Problem Solving in Organic Chemistry I</td>
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<tr>
<td>PHYS 211 College Physics</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 342 Organic Chemistry II</td>
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<tr>
<td>CHEM 362 Problem Solving in Organic Chemistry II</td>
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<tr>
<td>PHYS 212 College Physics</td>
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**Junior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Semester of a Foreign Language</td>
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<tr>
<td>Essential Studies and Other Electives</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 466 Fundamentals of Physical and Biophysical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>BMB 301 Biochemistry</td>
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**Senior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 467 Survey of Physical Chemistry Laboratory</td>
<td>2</td>
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<tr>
<td>BMB 401 Biochemistry of Proteins and Information Flow</td>
<td>3</td>
</tr>
<tr>
<td>BMB 403 Advanced Biochemistry Laboratory</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 492 Senior Research</td>
<td>3</td>
</tr>
</tbody>
</table>

**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, 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 101 Orientation to Chemistry.</td>
<td>1</td>
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</tbody>
</table>

Courses

**CHEM 101. Orientation to Chemistry.** 1 Credit.

This seminar course will introduce 1st year students pursuing either a BS in Chemistry or BS with major 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, alkylics, 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 115L. F.S.

**CHEM 121. General Chemistry I.** 3 Credits.

Open to all students; no high school credit in chemistry required. Includes principles and theories of chemistry; matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochernistry, bonding, molecular geometry, periodicity, gases. Prerequisite or Corequisite: MATH 103 or higher. F.S.S.

**CHEM 121L General Chemistry I Laboratory.** 1 Credit.

Laboratory to accompany CHEM 121. Prerequisite or Corequisite: CHEM 121L. F.S.S.

**CHEM 122. General Chemistry II.** 3 Credits.

Includes 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.

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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 for 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.
CHEM 122L. General Chemistry II Laboratory. 1 Credit. 
Laboratory to accompany CHEM 122. Prerequisite: CHEM 121 and CHEM 121L. Corequisite: CHEM 122. F,S,SS.

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 I Laboratory. 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 254. 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,SS.

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,SS.

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; carbynols: aldehydes, ketones; carboxylic acids, esters, amides. Prerequisites: CHEM 122 with a grade of C or better and CHEM 122L; 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, alkydes, alkyl halides and alcohols. Application 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, alkydes, 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 work on research problems under close faculty guidance. Total credits not to exceed 3. Prerequisite: Consent of Instructor. Repeatable to 3 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 for the following course sequences: CHEM 341, CHEM 342. 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 445. Inorganic Chemistry II. 3 Credits. 
Chemistry of inorganic compounds in terms of modern theories and concepts. Prerequisites: CHEM 254 and CHEM 342. Corequisites: CHEM 470 and 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 spectroscopic 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 and CHEM 471. F.

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.
Civil Engineering (CE)

http://www.engineering.und.edu/civil

Dockter, Gedafa, Gullicks (Chair), Jerath, 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. 607) 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**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>4</td>
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<tr>
<td>ENGL 110</td>
<td>3</td>
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<td>ENGR 101</td>
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<tr>
<td>MATH 165</td>
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<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>CE 101</td>
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<tr>
<td>CHEM 122 &amp; 122L &amp; BiOL 150&amp;BiOL 150L</td>
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<td>ENGL 130</td>
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<td>MATH 166</td>
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<thead>
<tr>
<th>Sophomore Year</th>
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<tbody>
<tr>
<td>CE 313</td>
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<td>CE 313L</td>
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<td>ENGR 201</td>
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<tr>
<td>MATH 265</td>
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<tr>
<td>PHYS 251</td>
<td>4</td>
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<tr>
<td>GEOE 203 or Geol 101</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<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>
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<tr>
<td>PHYS 252</td>
<td>University Physics II (includes lab)</td>
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<tr>
<td>Social Science</td>
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Total Credits: 17

**Junior Year**

**First Semester**

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<tr>
<td>CE 301</td>
<td>Civil Engineering Laboratory I</td>
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<tr>
<td>CE 306</td>
<td>Fluid Mechanics</td>
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<tr>
<td>CE 351</td>
<td>Structural Mechanics</td>
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<td>CE 412</td>
<td>Soil Mechanics</td>
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<td>Dynamics</td>
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<td>PHIL 250</td>
<td>Ethics in Engineering and Science</td>
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<td>or CHE 340</td>
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Credits: 18

**Second Semester**

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<tbody>
<tr>
<td>CE 302</td>
<td>Civil Engineering Laboratory II</td>
<td>2</td>
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<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>
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<tr>
<td>CE 451</td>
<td>Steel Design</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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Credits: 14

**Senior Year**

**First Semester**

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<tr>
<td>CE 432</td>
<td>Environmental Engineering II</td>
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<tr>
<td>CE 453</td>
<td>Reinforced Concrete</td>
<td>3</td>
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<tr>
<td>CE 421</td>
<td>Hydrology</td>
<td>3</td>
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<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>
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Technical Elective: 3

Credits: 17

**Second Semester**

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<tr>
<td>CE 414</td>
<td>Foundation Engineering</td>
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<tr>
<td>CE 416</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 444</td>
<td>Contracts and Specifications</td>
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</tr>
<tr>
<td>CE 483</td>
<td>Civil Engineering Design II</td>
<td>2</td>
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</table>

Technical Elective: 3

Social Science: 3

Credits: 17

Total Credits: 134

* Students are encouraged to take ENGL 130 Composition II.
** Students are encouraged to take GEoe 203 Earth Dynamics.

**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. 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: ENGR 101 and either CE 101 or permission of instructor. 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: ENGR 203 and ENGL 110. Corequisites: CE 201 and CE 412. F.

**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 one oral presentation. Prerequisites: ENGR 203 and ENGL 110. Corequisites: CE 201, CE 431, and CE 423. S.

**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 155. Corequisite: On-campus students must take CE 313 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 DEEP students. Prerequisite: DEEP 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 strength, 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. F.

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, lightgage 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 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: Two of these four: 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, Fiorido, Haslerud Opp, Jordheim, Kalbfleisch, Kenney, Kim, Lee, Myszkowski, Pasch, Rakow, Shafer, Trahan

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 Minnesota.

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

COMM 102 Communication and the Human Community 3
COMM 103 Information, Technology and Social Change 3
COMM 110 Fundamentals of Public Speaking 3
COMM 200 Introduction to Media Writing 3

University of North Dakota 95
COMM 410  Research Methods in Communication (junior or senior status required)  3

Total Credits  15

Experience

3 credits required with maximum of 6 credits allowed

COMM 329  Practicum (Consent of Instructor)  3-6
COMM 394  Individual Projects and Readings (Consent of Instructor)  3-6
COMM 497  Internship (Consent of Instructor)  3-6

Content Areas

6 credits required in each Areas A, B, and C.

Area A
Select two of the following:  6
COMM 300  Communication and Society  3
COMM 310  Media and Diversity  3
COMM 374  Principles of Strategic Communication  3
COMM 402  Intercultural/International Communication  3
COMM 404  Advertising and Society  3
COMM 414  Media Law and Ethics  3
COMM 428  Media History  3

Area B
Select two of the following:  3
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

Area C
Select two of the following:  3
COMM 206  Digital Communication: Fundamentals  3
COMM 319  Digital Communication: Imaging  3
COMM 328  Community Journalism  3
COMM 339  Digital Video Production  3

Note: Additional prerequisites may apply to some courses. Check individual course descriptions.

Minor in Communication

Required: 21 credits (4 required courses and 1 course from each of the three Areas A, B, and C below).

Students must complete:

COMM 102  Communication and the Human Community  3
COMM 103  Information, Technology and Social Change  3
COMM 110  Fundamentals of Public Speaking  3
COMM 200  Introduction to Media Writing  3

Area A (Students must complete one of the following):

COMM 300  Communication and Society  3
COMM 310  Media and Diversity  3
COMM 374  Principles of Strategic Communication  3
COMM 402  Intercultural/International Communication  3
COMM 404  Advertising and Society  3
COMM 414  Media Law and Ethics  3
COMM 428  Media History  3

Area A
Select two of the following:  3
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 304  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 319  Digital Communication: Imaging  3
COMM 328  Community Journalism  3
COMM 339  Digital Video Production  3

Area B (Students must complete one of the following):

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

Area C (Students must complete one of the following):

COMM 206  Digital Communication: Fundamentals  3
COMM 313  Persuasion  3
COMM 339  Digital Video Production  3
COMM 345  Social Media Strategy  3
### Courses

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>COMM 102</td>
<td>Communication and the Human Community</td>
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<tr>
<td>COMM 103</td>
<td>Information, Technology and Social Change</td>
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<td>COMM 110</td>
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<td>COMM 384</td>
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<td>COMM 401</td>
<td>Organizational Communication</td>
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Note: Some courses may have prerequisites; check individual course descriptions.

**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.

**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.

**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.

**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 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 Junior status or above. 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.
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.

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. Final report, employer's evaluation and samples of work required. 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.

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

Biberdorf, Cummings, Madden, Paulson, Rami (Chair), Robinson, Seddoh, Swisher and Weisz

It is the general mission of the Department of Communication Sciences and Disorders to provide academic and clinical instruction, supervised clinical practicum, and research experience for students; to provide clinical services to individuals, groups, and agencies within the University and greater Grand Forks area; to provide professional leadership within local, state, and national organizations; to contribute to the body of knowledge concerning communication processes and communication disorders; and to serve the University and participate in its governance. This mission is directed at meeting the needs of the University of North Dakota and its constituency.

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.

A minor in American Sign Language and Deaf Studies also is offered. The minor provides an option for students who wish to acquire American Sign Language skills and gain a greater understanding of the culture of the deaf community.

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 Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<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 461</td>
<td>Senior Seminar in Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>CSD 484</td>
<td>Clinical Practicum I: Speech-Language Pathology</td>
<td>3</td>
</tr>
<tr>
<td>CSD 485</td>
<td>Clinical Practicum II: Speech Language Pathology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits** 54-55

B. Major courses not required for the B.A., but recommended:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits** 3

C. Courses required in other departments:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<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>
</tbody>
</table>

Biberdorf, Cummings, Madden, Paulson, Rami (Chair), Robinson, Seddoh, Swisher and Weisz

It is the general mission of the Department of Communication Sciences and Disorders to provide academic and clinical instruction, supervised clinical practicum, and research experience for students; to provide clinical services to individuals, groups, and agencies within the University and greater Grand Forks area; to provide professional leadership within local, state, and national organizations; to contribute to the body of knowledge concerning communication processes and communication disorders; and to serve the University and participate in its governance. This mission is directed at meeting the needs of the University of North Dakota and its constituency.
PSYC 270 Abnormal Psychology 3
ENGL 209 Introduction to Linguistics 3
MATH 103 College Algebra 3
Select one of the following (Gerontology):
PSYC 355 Adulthood and Aging 3
SOC 352 Aging 3
SWK 313 Orientation to Gerontology 3
Select one of the following (Physics or Chemistry):
PHYS 110 Introductory Astronomy 3
PHYS 130 Natural Science-Physics 3
PHYS 140 Physics for Poets 3
PHYS 161 Introductory College Physics I 3
PHYS 211C College Physics I 3
CHEM 115 Introductory Chemistry 3
CHEM 121 General Chemistry I 3

Total Credits 24

D. Courses Required for Teacher Certification:
CSD 400 School Programs in Speech-Language-Hearing 3
CSD 585 Practicum in the School Setting 10
T&L 433 Multicultural Education 3
or CSD 425 Language, Multiculturalism and Communication Disorders 3
and IS 121, Introduction to American Indian Studies 3

Graduate students can choose courses from the list of 300-level courses above or from the higher level courses listed below:

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 514 Intervention Strategies with Infants and Toddlers 2
T&L 530 Foundations of Reading Instruction 3

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 accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.

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:
CSD 101 American Sign Language I 2
CSD 102 American Sign Language II 2
CSD 201 American Sign Language III 2
CSD 202 American Sign Language IV 2
CSD 343 Language Development 3
CSD 363 Deaf Studies 4
ENGL 209 Introduction to Linguistics 3
ANTH 171 Introduction to Cultural Anthropology 3

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 I 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, CSD 102 and CSD 201. S.

CSD 223. Phonetics. 3 Credits.
Introduction to Phonetics. Includes articulatory descriptions of the speech sounds of English and other language, 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 phonologic 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. F.

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 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, neurophysiology, neuropharmacology, 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 343, 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.

CSD 441. Language Disorders II. 3 Credits.
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 461. Senior Seminar in Communicaiton Disorders. 3 Credits.
Students will (1) learn to synthesize knowledge of the various areas of communication disorders, (2) develop an ability to read critically and evaluate the research literature in communication disorders, and (3) develop their writing skills. This is a writing intensive course. Prerequisite: Senior status. 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,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,SS.

CSD 489. Senior Honors Thesis. 1-8 Credits.
Supervised independent study culminating in a thesis. Repeatable to 9 credits. Repeatable to 9 credits. F,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.
IV. Courses from other departments as follows:

III. Courses from Computer Science as follows:

II. College of Arts and Sciences Requirements. See College listing.

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

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

Total Credits 49

* 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>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>
</tbody>
</table>

CSCI Electives ** 12

Total Credits 49

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:

CSCI 160       Computer Science I  *  4
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 269 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:

III. Information Technology
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. F.S.SS.

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. F.

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 200. 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 269. 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.S.SS.

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 (encryption, 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. F.S.

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 methodologies, fit 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. S, odd years.

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. 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. Prerequisite: CSCI 492. 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://www.und.edu/counseling-psychology-community-services

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 Whitchcomb

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 Counselor Education (NCATE). The Ph.D. in Counseling Psychology is accredited by the American Psychological Association (APA) and prepares graduates for Psychological 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:
   3. COUN 506 Rehabilitation Counseling: Foundations and Ethical Issues 3
   4. COUN 510 Counseling Methods 3
   5. COUN 514 Rehabilitation Counseling: Assessment and Evaluation 3
   6. COUN 515 Methods of Research 3
   7. COUN 516 Counseling Research Laboratory 1
   8. COUN 518 Group Theory and Process 3
   9. COUN 519 Career Counseling 3
   10. COUN 530 Theories of Counseling, Personality and Development 3
   11. COUN 531 Psychology of Women, Gender and Development 3
   12. COUN 532 Multicultural Counseling 3
   13. COUN 533 Couples And Family Counseling 3
   14. COUN 580 Counseling Practicum 4

3. Completion of 8 credits of COUN 588 Rehabilitation Counseling Internship.
4. 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](http://www.arts-sciences.und.edu/criminal-justice)

DiCristina, Gottschalk, Hume (Chair), 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>CJ 270</td>
<td>Introduction to Corrections</td>
<td>3</td>
</tr>
<tr>
<td>SOC 253</td>
<td>Juvenile Delinquency</td>
<td>3</td>
</tr>
</tbody>
</table>

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):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 210</td>
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<td>Introduction to Corrections</td>
<td>3</td>
</tr>
<tr>
<td>SOC 253</td>
<td>Juvenile Delinquency</td>
<td>3</td>
</tr>
</tbody>
</table>

**Required upper division courses**

[http://www.arts-sciences.und.edu/criminal-justice](http://www.arts-sciences.und.edu/criminal-justice)

DiCristina, Gottschalk, Hume (Chair), 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.
CJ 330  Criminological Theory  3
CJ 341  Criminal Law  3
CJ 342  Criminal Procedure  3
CJ 401  Administration of Criminal Justice Systems  3
SOC 323  Sociological Research Methods  3
SOC 326  Sociological Statistics  3
PHIL 460  Philosophy of Law  3
Select three of the following:  9
  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  3
- CJ 210  Introduction to Policing  3
- CJ 270  Introduction to Corrections  3
- SOC 253  Juvenile Delinquency  3

Select three of the following:  9
  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
  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
PHIL 460  Philosophy of Law
SOC 252  Criminology

Total Credits  21

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 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 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 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.

Earth System Science and Policy (ESSP)

http://essp.und.edu/

Hill, Kirilenko, Lagueau (Chair), Romsdahl (Graduate Director), VanLooy, Zhang and Zheng

The undergraduate program in Earth System Science and Policy is organized around the field of environmental sustainability and offers a minor in Sustainability Studies. 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.

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. VanLooy.

Minor in Sustainability Studies

Required 21 credits including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESSP 160</td>
<td>3</td>
<td>Sustainability &amp; Society</td>
</tr>
<tr>
<td>ESSP 200</td>
<td>3</td>
<td>Sustainability Science</td>
</tr>
<tr>
<td>Two electives from the following proposed ESSP courses</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>ESSP 330</td>
<td></td>
<td>Environmental Change: Adaptation &amp; Mitigation</td>
</tr>
<tr>
<td>ESSP 310</td>
<td></td>
<td>Sustainable Food Systems</td>
</tr>
<tr>
<td>ESSP 320</td>
<td></td>
<td>Land and Water Sustainability</td>
</tr>
<tr>
<td>ESSP 333</td>
<td></td>
<td>Oceanography</td>
</tr>
<tr>
<td>ESSP 420</td>
<td></td>
<td>Sustainable Energy</td>
</tr>
<tr>
<td>ESSP 450</td>
<td></td>
<td>Environmental and Natural Resource Economics</td>
</tr>
<tr>
<td>ESSP 460</td>
<td></td>
<td>Global Environmental Policy</td>
</tr>
<tr>
<td>ESSP 499</td>
<td></td>
<td>Special Topics in Sustainability</td>
</tr>
<tr>
<td>ESSP 570</td>
<td></td>
<td>Communicating Environmental Information</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.

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.
ECON 201 Principles of Microeconomics 3
ECON 202 Principles of Macroeconomics 3
ECON 210 Introduction to Business and Economic Statistics 3

* MATH 146 Calculus I, may be substituted for MATH 146 Applied Calculus I.

II. College of Business and Public Administration Core Requirements (40 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

Total Credits 15
ECON 303  Money and Banking  3
ISBC 117  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

* 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. Required Major Courses (27 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 305  Principles of Banking I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 306  Principles of Banking II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 308  Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 309  Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 405  Bank Regulation</td>
<td>3</td>
</tr>
<tr>
<td>ECON 438  International Money and Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 340  Intermediate Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 360  Capital Market Financing and Investment Strategies *</td>
<td>3</td>
</tr>
<tr>
<td>FIN 375  Lending and Liquidity Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits  27

* ACCT 218 Advanced Spreadsheet Applications is waived as a prerequisite for Banking and Financial Economics majors.

IV. Elective Major Courses: Choose at least 12 credit hours from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 301  Intermediate Accounting I *</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 302  Intermediate Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 395  Special Topics in Economics **</td>
<td>1-3</td>
</tr>
<tr>
<td>ECON 397  Cooperative Education **</td>
<td>1-4</td>
</tr>
<tr>
<td>ECON 410  Empirical Methods in Economics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 411  Economic Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 414  Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 416  Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>ECON 497  Internship **</td>
<td>1-4</td>
</tr>
<tr>
<td>FIN 321  Real Estate Finance and Investment</td>
<td>3</td>
</tr>
<tr>
<td>FIN 324  Real Estate Appraisal</td>
<td>3</td>
</tr>
<tr>
<td>FIN 350  Financial Statement Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FIN 420  Investment Analysis and Portfolio Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 450  Financial Derivatives</td>
<td>3</td>
</tr>
<tr>
<td>FIN 491  Senior Topics in Finance **</td>
<td>3</td>
</tr>
</tbody>
</table>

* ACCT 218 Advanced Spreadsheet Applications is waived as a prerequisite for Banking and Financial Economics majors.
** No more than 3 hours of electives from ECON 395 Special Topics in Economics, ECON 397 Cooperative Education, ECON 497 Internship and FIN 491 Senior Topics in Finance may count toward the elective major courses.

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 (see University ES listing: 39 credit hours).

The following are required by CoBPA (12 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110  Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103  College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146  Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115  American Government I</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171  Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111  Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110  Introduction to Sociology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits  15

II. College of Business and Public Administration Core Requirements (40 credit hours):

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>ACCT 200  Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201  Elements of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 315  Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201  Principles of Microeconomics *</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202  Principles of Macroeconomics **</td>
<td>3</td>
</tr>
<tr>
<td>ECON 210  Introduction to Business and Economic Statistics **</td>
<td>3</td>
</tr>
<tr>
<td>ECON 303  Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117  Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>ISBC 217  Fundamentals of Computer Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310  Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 300  Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301  Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 475  Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 305  Marketing Foundations</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits  40

* 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. Required Major Courses (15 credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 308  Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 309  Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 338  International Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 410  Empirical Methods in Economics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 414  Managerial Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 305  Principles of Banking I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 324  Public Finance</td>
<td>3</td>
</tr>
<tr>
<td>ECON 330  Business and Economic History</td>
<td>3</td>
</tr>
<tr>
<td>ECON 341  Labor Economics and Labor Relations</td>
<td>3</td>
</tr>
<tr>
<td>ECON 355  Government Regulation of Business</td>
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</tr>
<tr>
<td>ECON 380  Global Economic Development</td>
<td>3</td>
</tr>
</tbody>
</table>
I. Essential Studies Requirements (see University ES listing: 39 credit hours)

Which must be from a 4-year institution) including:

- Consulting firms, and as administrators and managers in a wide range of fields.
- Professors, as researchers for government agencies, in businesses and
careers as professional economists. Professional economists work as college
careers in law, government service, or business, as well as those planning
political economy, financial markets, and public policy analysis. The major in
history, capital theory and finance, labor economics, income distribution,
trade and finance, public sector economics, economic development, economic

Electives permit further study in a wide range of fields, including international
courses in micro theory and macro theory give a deeper analytical foundation.

The system works in the United States and throughout the world. The introductory
College of Arts and Sciences

Option B (Quantitative Option)* - Choose 12 credit hours from the following:

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<td>ECON 303</td>
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</tr>
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<td>Senior Honors Thesis</td>
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<td>ECON 575</td>
<td>Advanced Special Topics</td>
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* No more than 6 credit hours of electives from ECON 397 Cooperative
  Education, ECON 495 Readings in Economics, ECON 496 Research in
  Economics, and ECON 497 Internship may count toward the elective major
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Option B (Quantitative Option)* - Choose 12 credit hours from the following:

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<td>ECON 111</td>
<td>Economic Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 116</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
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* Students seeking to prepare for graduate school in Economics are advised
to choose Option B.

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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 210</td>
<td>Introduction to Business and Economic Statistics</td>
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<td>ECON 338</td>
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</tr>
</tbody>
</table>

ECON 410 Empirical Methods in Economics I 3

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:

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<td>ECON 305</td>
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Option B (Quantitative Option)* - Choose 12 credit hours from the following:

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* Students seeking to prepare for graduate school in Economics are advised
to choose Option B.

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):

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</table>

Total Credits 15
II. Economics electives (5 credit hours):

- ECON 210 Introduction to Business and Economic Statistics 3
- ECON 305 Principles of Banking I 3
- ECON 324 Public Finance 3
- ECON 330 Business and Economic History 3
- ECON 338 International Economics 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 400 History of Economic Thought 3
- ECON 405 Bank Regulation 3
- ECON 409 Current Issues in Macroeconomic Policy 3
- 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 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.

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 the areas of public utilities, telecommunications, and trucking. Prerequisites: ECON 201 and ECON 202.
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, Marxist, 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,SS.

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. S,SS.

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,SS.

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,SS.

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. Regular 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.

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, Nejadpak, Noghianian, Ranganathan, Salehef, and Takovkian

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 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;

and 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. 607) 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

B.S. in Electrical Engineering with a Computer Science Focus

B.S. in Electrical Engineering with a Biomedical Engineering Focus

B.S. in Electrical Engineering with an Aerospace Focus

---

**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:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></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>
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<tr>
<td>EE 101 Introduction to Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
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<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>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>18</strong></td>
</tr>
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<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>EE 201 Introduction to Digital Electronics</td>
<td>2</td>
</tr>
<tr>
<td>EE 202 Electrical Engineering Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EE 304 Computer Aided Measurement and Controls</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166 Calculus II</td>
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<td>PHYS 251 University Physics I</td>
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<td>Fine Arts Elective (A&amp;H)</td>
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<table>
<thead>
<tr>
<th>Sophomore Year</th>
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<td>First Semester</td>
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<tr>
<td>EE 206 Circuit Analysis</td>
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<td>EE 306 Circuits Laboratory I</td>
<td>1</td>
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<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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</tr>
<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
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<tr>
<td>MATH 265 Calculus III</td>
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<tr>
<td>PHYS 252 University Physics II</td>
<td>4</td>
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<tr>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>EE 307 Circuits Laboratory II</td>
<td>1</td>
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<tr>
<td>EE 313 Linear Electric Circuits</td>
<td>3</td>
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<tr>
<td>EE 318 Engineering Data Analysis</td>
<td>3</td>
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<tr>
<td>ENGR 460 Engineering Economy</td>
<td>3</td>
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<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<td>EE 308 Electronics Laboratory I</td>
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<tr>
<td>EE 314 Signals and Systems</td>
<td>3</td>
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<tr>
<td>EE 314L Signal and Systems Laboratory</td>
<td>1</td>
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<tr>
<td>EE 316 Electric and Magnetic Fields</td>
<td>3</td>
</tr>
<tr>
<td>EE 321 Electronics I</td>
<td>3</td>
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<tr>
<td>A&amp;H or SS Elective</td>
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</tr>
<tr>
<td>Non EE Elective</td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>EE 309 Electronics Lab II</td>
<td>1</td>
</tr>
<tr>
<td>EE 405 Control Systems I</td>
<td>3</td>
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<tr>
<td>EE 405L Control Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EE 409 Distributed Networks</td>
<td>3</td>
</tr>
<tr>
<td>EE 421 Electronics II</td>
<td>3</td>
</tr>
<tr>
<td>EE 452 Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 452L Embedded Systems Design Laboratory</td>
<td>1</td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>EE 401 Electric Drives</td>
<td>3</td>
</tr>
<tr>
<td>EE 401L Electric Drives Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EE 480 Senior Design I</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering Elective</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering Elective</td>
<td>3</td>
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<tr>
<td><strong>Credits</strong></td>
<td><strong>13</strong></td>
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<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>EE 481 Senior Design II</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering Elective</td>
<td>3</td>
</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>
<td><strong>Credits</strong></td>
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</tr>
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<td><strong>Total Credits</strong></td>
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</tr>
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</table>

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 courses.

4. Non EE Elective choices: ENGR 201 Statics, ENGR 202 Dynamics; ENGR 203 Mechanics of Materials; ME 301 Materials Science; CE 306 Fluid Mechanics/ME 306 Fluid Mechanics; and ME 341 Thermodynamics, Computer Science, Engineering (including EE), Math and Physics courses approved by advisor, normally 300 level or higher (Math 308 History of Math and Math 321 Applied Statistical Methods do not meet the requirements of non EE electives). CSci 242 Algorithms and Data Structures, CSci 260 Advanced Programming Languages, and Math 208 Discrete Mathematics are permitted.

5. Senior standing with approval of adviser. EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C).

6. EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
II. The Following Curriculum

Catalog for a listing of acceptable Essential Studies courses. Diversity, and Special Emphasis Requirements (refer to the online Academic

I. The University's Essential Studies Breadth of Knowledge, Social-Cultural

which must be from a 4-year institution) including:

Required 129 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

Aerospace Focus

B.S. in Electrical Engineering with an

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

Some of the following courses may be waived by completing: ENGR 102

EE 101     Introduction to Electrical Engineering     1
EE 201     Introduction to Digital Electronics     2
EE 202     Electrical Engineering Laboratory     1
EE 304     Computer Aided Measurement and Controls     3
EE 397     Cooperative Education     1-3

III. Grade of “C” or better in all EE courses required for graduation.

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

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>3</td>
</tr>
<tr>
<td>EE 101</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
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<tr>
<td>MATH 165</td>
<td>4</td>
</tr>
<tr>
<td>Social Sciences Elective (SS) 2,3</td>
<td>3</td>
</tr>
<tr>
<td>Humanities Elective (A&amp;H) 2,3</td>
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</table>

| Total Credits | 18 |

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 201</td>
<td>2</td>
</tr>
<tr>
<td>EE 202</td>
<td>1</td>
</tr>
<tr>
<td>EE 304</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>4</td>
</tr>
<tr>
<td>Fine Arts Elective (A&amp;H) 2,3</td>
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</table>

| Total Credits | 17 |

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 206</td>
<td>3</td>
</tr>
<tr>
<td>EE 306</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>3</td>
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<tr>
<td>MATH 207</td>
<td>2</td>
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<tr>
<td>MATH 265</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>4</td>
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</table>

| Total Credits | 17 |

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AVIT 102</td>
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<tr>
<td>EE 307</td>
<td>1</td>
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<tr>
<td>EE 313</td>
<td>3</td>
</tr>
<tr>
<td>EE 318</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 460</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266</td>
<td>3</td>
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</table>

| Engineering Economy(SS) 2 | 3 |
| Elementary Differential Equations | 3 |

| Credits | 18 |

Junior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AVIT 221</td>
<td>3</td>
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<tr>
<td>EE 308</td>
<td>1</td>
</tr>
<tr>
<td>EE 314</td>
<td>3</td>
</tr>
<tr>
<td>EE 314L</td>
<td>1</td>
</tr>
<tr>
<td>EE 316</td>
<td>3</td>
</tr>
<tr>
<td>EE 321</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;H or SS Elective 2,3</td>
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| Credits | 17 |

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AVIT 323</td>
<td>3</td>
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<tr>
<td>AVIT 324</td>
<td>3</td>
</tr>
<tr>
<td>EE 309</td>
<td>1</td>
</tr>
<tr>
<td>EE 405</td>
<td>3</td>
</tr>
<tr>
<td>EE 405L</td>
<td>1</td>
</tr>
<tr>
<td>EE 421</td>
<td>3</td>
</tr>
<tr>
<td>EE 452</td>
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<tr>
<td>EE 452L</td>
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| Credits | 18 |

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>EE 480</td>
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<tr>
<td>Electrical Engineering Elective 7</td>
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<tr>
<td>Electrical Engineering Elective 7</td>
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</table>

| Non-EE Elective 4 | 3 |

| Credits | 12 |

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<td>Electrical Engineering Elective 7</td>
<td>3</td>
</tr>
<tr>
<td>Ethics Elective (A&amp;H or SS) 2,3,8</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 12 |

| Total Credits | 129 |

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.

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 481 Senior Design II meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

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.

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).

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>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 150</td>
<td>General Biology I</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>
<td>3</td>
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<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory</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</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
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| Credits       | 16 |

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>BIOL 151</th>
<th>General Biology II</th>
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<tr>
<td></td>
<td>BIOL 151L</td>
<td>General Biology II Laboratory</td>
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<tr>
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<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>EE 202</td>
<td>Electrical Engineering Laboratory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>EE 304</td>
<td>Computer Aided Measurement and Controls</td>
<td>3</td>
</tr>
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<td>MATH 166</td>
<td>Calculus II</td>
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<tr>
<td></td>
<td>PHYS 251</td>
<td>University Physics I</td>
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| Credits | 18 |

<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>
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<tr>
<td>EE 306</td>
<td>Circuits Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td>PHYS 252</td>
<td>University Physics II</td>
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| Credits | 15 |

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>ANAT 204</th>
<th>Anatomy for Paramedical Personnel</th>
<th>3</th>
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<tbody>
<tr>
<td></td>
<td>EE 307</td>
<td>Circuits Laboratory II</td>
<td>1</td>
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<tr>
<td></td>
<td>EE 313</td>
<td>Linear Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EE 318</td>
<td>Engineering Data Analysis</td>
<td>3</td>
</tr>
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<td></td>
<td>ENGR 460</td>
<td>Engineering Economy (SS)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
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| Credits | 16 |

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 308</td>
<td>Electronics Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>EE 314</td>
<td>Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 314L</td>
<td>Signal and Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EE 316</td>
<td>Electric and Magnetic Fields</td>
<td>3</td>
</tr>
<tr>
<td>EE 321</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111 or SOC 110</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td></td>
<td>Introduction to Sociology</td>
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<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
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| Credits | 18 |

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<tr>
<th>Second Semester</th>
<th>EE 309</th>
<th>Electronics Lab II</th>
<th>1</th>
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<tbody>
<tr>
<td></td>
<td>EE 405</td>
<td>Control Systems I</td>
<td>3</td>
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<td></td>
<td>EE 405L</td>
<td>Control Systems Laboratory</td>
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<tr>
<td></td>
<td>EE 409</td>
<td>Distributed Networks</td>
<td>3</td>
</tr>
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<td></td>
<td>EE 421</td>
<td>Electronics II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EE 452</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EE 452L</td>
<td>Embedded Systems Design Laboratory</td>
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| Credits | 15 |

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 480</td>
<td>Senior Design I</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<td></td>
</tr>
<tr>
<td>Humanities (A&amp;H)</td>
<td>2, 3</td>
<td></td>
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<tr>
<td>Fine Arts Elective (A&amp;H)</td>
<td>2, 3</td>
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</tr>
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| Credits | 15 |

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>EE 481</th>
<th>Senior Design II</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Electrical Engineering Elective</td>
<td>7</td>
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<tr>
<td></td>
<td>Non-EE Elective</td>
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<td></td>
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<td></td>
<td>Ethics Elective (A&amp;H or SS)</td>
<td>2, 3, 8</td>
<td></td>
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<tr>
<td></td>
<td>A&amp;H or SS Elective</td>
<td>2, 3</td>
<td></td>
</tr>
</tbody>
</table>

| Credits | 15 |

| Total Credits | 128 |

Additional Recommended Pre-Medical Courses

| ANAT 204L | Anatomy for Paramedical Personnel Laboratory | 2 |
| BIOC 315  | Genetics | 3 |
| BIOC 369  | Histology | 4 |
| & 369L    | Histology Lab | 4 |
| BIOC 420  | Neuroscience | 3 |
| BMB 301   | Biochemistry | 3 |
| CHEM 341  | Organic Chemistry I | 3 |
| CHEM 341L | Organic Chemistry I Laboratory (Chem 341/341L required for UND Medical School) | 1 |
| CHEM 342  | Organic Chemistry II | 3 |
| CHEM 342L | Organic Chemistry II Laboratory (Chem 342/342L required for UND Medical School) | 1 |
| MBIO 302  | General Microbiology Lecture | 2 |
| MBIO 302L | General Microbiology Laboratory | 2 |

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.
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.


EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C).

EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O).

Maximum of three credits of EE 490 Electrical Engineering Problems, are allowed as an independent study, applicable to both EE and non EE electives. Recommended EE Elective: EE 550 Biomedical Instrumentation. 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 251 Ethics in Health Care (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).

III-Grade of "C" or better in all EE courses required for graduation.

B.S. in Electrical Engineering with a Computer Science 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121</td>
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<tr>
<td>CHEM 121L</td>
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<tr>
<td>CSCI 130 or CSCI 160</td>
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<tr>
<td>EE 101</td>
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<tr>
<td>ENGL 110</td>
<td>1</td>
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<tr>
<td>MATH 165</td>
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<td>Humanities Elective (A&amp;H)</td>
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<td><strong>Total Credits</strong></td>
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### Second Semester

<table>
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<tr>
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<tr>
<td>CSCI 161</td>
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<td>EE 201</td>
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</tr>
<tr>
<td>EE 202</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166</td>
<td>4</td>
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<tr>
<td>Fine Arts Elective (A&amp;H)</td>
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<tr>
<td><strong>Total Credits</strong></td>
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### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CSCI 230</td>
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<tr>
<td>EE 206</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 306</td>
<td>1</td>
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<tr>
<td>MATH 208</td>
<td>3</td>
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<td>MATH 265</td>
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<td>PHYS 251</td>
<td>4</td>
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<td><strong>Total Credits</strong></td>
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### Junior Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 308</td>
<td>1</td>
</tr>
<tr>
<td>EE 314</td>
<td>3</td>
</tr>
<tr>
<td>EE 314L</td>
<td>1</td>
</tr>
<tr>
<td>EE 316</td>
<td>3</td>
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<tr>
<td>EE 321</td>
<td>3</td>
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<td>EE 451</td>
<td>3</td>
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<tr>
<td>ENGL 130</td>
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<td><strong>Total Credits</strong></td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 309</td>
<td>1</td>
</tr>
<tr>
<td>EE 405</td>
<td>3</td>
</tr>
<tr>
<td>EE 405L</td>
<td>1</td>
</tr>
<tr>
<td>EE 409</td>
<td>3</td>
</tr>
<tr>
<td>EE 421</td>
<td>3</td>
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<td>EE 452</td>
<td>3</td>
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<td>EE 452L</td>
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<td><strong>Total Credits</strong></td>
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### Senior Year

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 480</td>
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<tr>
<td>EE 207</td>
<td>3</td>
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<tr>
<td>EE 208</td>
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<td>MATH 207</td>
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<td>Social Sciences Elective (SS)</td>
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#### Second Semester

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>EE 481</td>
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</tr>
<tr>
<td>Electrical Engineering Elective</td>
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<td>A&amp;H or SS Elective</td>
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<td><strong>Total Credits</strong></td>
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</table>

**Total Credits:** 129

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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.
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:

- EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C).
- EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
- 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.
- 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).
- 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.

Ill-Grade of “C” or better in all EE major courses is required for graduation.

**Minor in Aviation - Professional Flight**

Required: 14 Aviation credits from the B.S.E.E. program, plus the following 16 additional credits:

<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>
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<tr>
<td>ATSC 110L</td>
<td>Meteorology I Laboratory</td>
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<tr>
<td>ATSC 231</td>
<td>Aviation Meteorology</td>
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<tr>
<td>AVIT 208</td>
<td>Aviation Safety</td>
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<tr>
<td>AVIT 222</td>
<td>IFR Regulations and Procedures</td>
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<tr>
<td>AVIT 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>2</td>
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</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 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. Senior standing with approval of adviser. EE 480 Senior Design I, meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C).
5. EE 481 Senior Design II, meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
6. Basic or Applied Science Elective choices: AVIT 421 Advanced Aerodynamics; CHEM 122 General Chemistry II/CHM 122 General Chemistry II Laboratory; PHYS 253 University Physics III; SPST 500 Introduction to Orbital Mechanics; and Physics courses 300 level or higher with approval of instructor and adviser. Three or four credits, depending on whether the class has a prerequisite laboratory.
7. Maximum of three credits of EE 490 Electrical Engineering Problems, allowed as an independent study.
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).

**Biomedical Engineering Minor**

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:

- EE 101. Introduction to Electrical Engineering. 1 Credit.
- EE 201. Introduction to Digital Electronics. 2 Credits.
- EE 202. Electrical Engineering Laboratory. 1 Credit.
- EE 204. Computer Aided Measurement and Controls. 3 Credits.
- EE 306. Circuits Laboratory I. 1 Credit.
- EE 307. Circuits Laboratory II. 1 Credit.
- EE 308. Electronics Laboratory I. 1 Credit.
- EE 309. Electronics Lab II. 1 Credit.
- EE 313. Linear Electric Circuits. 3 Credits.
- EE 314. Signals and Systems. 3 Credits.

**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 202. Electrical Engineering 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. F.

**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. Prerequisite: MATH 165. F.

**EE 306. Circuits Laboratory I. 1 Credit.**
Introduction to methods of experimental circuit analysis and to proper uses of laboratory equipment. Corequisite: EE 206. F,SS.

**EE 307. Circuits Laboratory II. 1 Credit.**
Experimental circuit analysis and proper uses of laboratory equipment. Prerequisite: EE 306. Corequisite: EE 313. S,SS.

**EE 308. Electronics Laboratory I. 1 Credit.**
Practical electronics application and design using theory studied in concurrent third year electrical engineering courses. Prerequisite: EE 307. Corequisite: EE 321. F.

**EE 309. Electronics Lab II. 1 Credit.**
Practical electronics application and design using theory studied in concurrent third year electrical engineering courses. Prerequisite: EE 308. Corequisite: EE 421. S.

**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. Prerequisite: EE 206 with a grade of C or better. Corequisite: EE 307. S.

**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; PHYS 252. 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 308. 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. Corequisite: 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 405. S.

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 309. 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 real-time computer systems. Prerequisite: EE 201 and EE 304; or consent of instructor. On demand.

EE 452. Embedded Systems. 3 Credits.
a study of embedded systems 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.
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 CADD 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 or permission of the College of Engineering. F,S.

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 204. 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.

English Language and Literature (Engl)
http://www.arts-sciences.und.edu/english

Alberts, Basgier, Beard, Carson, Conway, Czerwiec, Dixon, Donehower, Flynn, Harris, Huang, Kitzes, Koepke, Nelson, O'Donnell, Ommen, Pasch, Robison, Sauer, Shafer, 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 good 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 271</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 272</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 301</td>
<td></td>
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<tr>
<td>ENGL 302</td>
<td></td>
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<tr>
<td>&amp; ENGL 303</td>
<td></td>
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<tr>
<td>&amp; ENGL 304</td>
<td></td>
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</tbody>
</table>

Select one of the following: 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 415</td>
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<tr>
<td>ENGL 414</td>
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</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGL 226</td>
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<tr>
<td>ENGL 306</td>
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<tr>
<td>ENGL 307</td>
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<td>ENGL 308</td>
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<tr>
<td>ENGL 408</td>
<td></td>
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<tr>
<td>ENGL 413</td>
<td></td>
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<tr>
<td>ENGL 414</td>
<td></td>
</tr>
</tbody>
</table>

You may also consider pursuing a Certificate in Writing and Editing or taking any of the courses included in the Certificate:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 427</td>
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<tr>
<td>ENGL 428</td>
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<tr>
<td>ENGL 429</td>
<td></td>
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</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 209</td>
<td></td>
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<tr>
<td>ENGL 309</td>
<td></td>
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<tr>
<td>ENGL 370</td>
<td></td>
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<tr>
<td>ENGL 417</td>
<td></td>
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<tr>
<td>ENGL 418</td>
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<tr>
<td>ENGL 419</td>
<td></td>
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<tr>
<td>ENGL 442</td>
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</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 372</td>
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</tbody>
</table>

Advanced study in particular genres or periods (topics rotate and may be repeated with different topics)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 401</td>
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<tr>
<td>ENGL 403</td>
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<tr>
<td>ENGL 404</td>
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<td>ENGL 405</td>
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<tr>
<td>ENGL 407</td>
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<tr>
<td>ENGL 408</td>
<td></td>
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<tr>
<td>ENGL 415</td>
<td></td>
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</tbody>
</table>

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 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.

Required in the major:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 309</td>
<td></td>
</tr>
<tr>
<td>ENGL 359</td>
<td></td>
</tr>
<tr>
<td>ENGL 308</td>
<td></td>
</tr>
<tr>
<td>ENGL 408</td>
<td></td>
</tr>
<tr>
<td>ENGL 414</td>
<td></td>
</tr>
</tbody>
</table>

You may also consider pursuing a Certificate in Writing and Editing or taking any of the courses included in the Certificate:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 427</td>
<td></td>
</tr>
<tr>
<td>ENGL 428</td>
<td></td>
</tr>
<tr>
<td>ENGL 429</td>
<td></td>
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</tbody>
</table>

Recommended in the major:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 209</td>
<td></td>
</tr>
<tr>
<td>ENGL 301</td>
<td></td>
</tr>
<tr>
<td>ENGL 302</td>
<td></td>
</tr>
<tr>
<td>ENGL 303</td>
<td></td>
</tr>
</tbody>
</table>
ENGL 304 Survey of American Literature 3
ENGL 315 Shakespeare 3
ENGL 316 Shakespeare 3
ENGL 357 Women Writers and Readers 3
ENGL 359 Young Adult Literature 3
ENGL 365 Black American Writers 3

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. 604) 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 319</td>
<td>Inclusive Strategies</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 399</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 416</td>
<td>Adolescent Literacy Development</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 423</td>
<td>Methods/Materials for Teaching Middle/Secondary</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>1-4</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>

Total Credits 29-44

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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

Total Credits 2-4

Minor in English

Required: 20 hours, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 271</td>
<td>Reading and Writing about Texts</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 272</td>
<td>Introduction to Literary Criticism</td>
<td>3</td>
</tr>
</tbody>
</table>

English electives, nine credits of which must be numbered 300 or above 15

Total Credits 21

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 309</td>
<td>Modern Grammar</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 359</td>
<td>Young Adult Literature</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 308</td>
<td>The Art of Writing Nonfiction</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 408</td>
<td>Writing for Digital Environments</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 9

Certificate in Writing and Editing

The ability to present ideas and concepts articulately 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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 234</td>
<td>Introduction to Writing, Editing, and Publishing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 334</td>
<td>Practicum in Writing, Editing, and Publishing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 428</td>
<td>Digital Humanities</td>
<td>3</td>
</tr>
</tbody>
</table>

One of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 226</td>
<td>Introduction to Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 308</td>
<td>The Art of Writing Nonfiction</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 408</td>
<td>Writing for Digital Environments</td>
<td>3</td>
</tr>
</tbody>
</table>

Six credits from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 273</td>
<td>Graphic Design Foundations</td>
<td>3</td>
</tr>
<tr>
<td>COMM 206</td>
<td>Digital Communication: Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>COMM 305</td>
<td>Web and Mobile Publishing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 319</td>
<td>Digital Communication: Imaging</td>
<td>3</td>
</tr>
<tr>
<td>COMM 345</td>
<td>Social Media Strategy</td>
<td>3</td>
</tr>
<tr>
<td>TECH 102</td>
<td>Digital Design Software</td>
<td>1-4</td>
</tr>
<tr>
<td>TECH 112</td>
<td>Graphic Design Software and Technologies II</td>
<td>1-4</td>
</tr>
<tr>
<td>TECH 212</td>
<td>Visual Literacy</td>
<td>3</td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
</tr>
</tbody>
</table>

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 WriterPlacer 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 225. 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 text from various
historical periods as it introduces students to the pleasures of analyzing text
and culture. Repeatable when topics vary. 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 global 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 introduction to English Studies offering practice in the
conventions of analyzing texts and of writing literary analysis. Required of
English majors. F.S.

ENGL 272. Introduction to Literary Criticism. 3 Credits.
A writing-intensive course that introduces students to various schools of literary
criticism. 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 307. Creative Writing: Poetry. 3 Credits.
Intermediate-level study and practice of poetry-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.
Shakespeare's works studied in chronological sequence. F.

ENGL 316. Shakespeare. 3 Credits.
Shakespeare's works studied in chronological sequence. S.

ENGL 320. Studies in American Fiction. 3 Credits.
Repeatable when topics vary. Repeatable to 30 credits. F.

ENGL 321. Studies in American Poetry. 3 Credits.
Repeatable when topics vary. Repeatable. F.

ENGL 322. Studies in American Drama. 3 Credits.
Repeatable when topics vary. Repeatable to 16 credits. S.

ENGL 330. Studies in English Fiction. 3 Credits.
Repeatable when topics vary. Repeatable. S.

ENGL 331. Studies in English Poetry. 3 Credits.
Repeatable when topics vary. Repeatable. S.

ENGL 332. Studies in English Drama. 3 Credits.
Repeatable when topics vary. Repeatable. F.

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.

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
disciplinary training in close reading, careful writing, and interpretative analysis.
Repeatable to 15 credits. Prerequisites: 15 credits completed in English, overall
GPA of 2.5, English GPA of 2.75, and department approval. Repeatable to 15
credits. S/U grading. F.S,SS.

ENGL 398. Independent Study. 1-4 Credits.
Supervised independent study. Only 6 hours may apply to the 36-hour
English major. Prerequisites: English majors only and written consent of the
department. Repeatable to 40 credits. F.S.

ENGL 399. Honors Tutorial. 2-4 Credits.

ENGL 401. Studies in Medieval Literature. 3 Credits.
A course in the literature of England in the medieval period. Repeatable when
topics vary. F, even years.

ENGL 403. Studies in Colonial American Literature. 3 Credits.
A course in the literature of America in the colonial period. Repeatable when
topics vary. Repeatable. F, even years.

ENGL 404. Studies in Renaissance Literature. 3 Credits.
A course in the literature of the English Renaissance. Repeatable when topics
vary. Repeatable. S, odd years.

ENGL 405. Studies in Restoration and Eighteenth Century Literature. 3
Credits.
A course in the English literature of the Restoration and 18th century.
Repeatable when topics vary. Repeatable. S, even years.
ENGL 406. Studies in Nineteenth Century Literature. 3 Credits.
A course in literature in English of the 19th Century. Repeatable when topics vary. Repeatable. F,S.

ENGL 407. Studies in Twentieth Century Literature. 3 Credits.
A course in literature in English of the 20th Century. Repeatable when topics vary. Repeatable. F,S.

ENGL 408. Advanced Composition. 3 Credits.
Intensive work in advanced writing in English Studies or other professional fields. Prerequisite: ENGL 120 or ENGL 125 or ENGL 130. S.

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 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 305, 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 417. Special Topics in Language. 1-4 Credits.
A course for advanced students on topics varying from year to year. Repeatable. Repeatable. F.

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 423. Methods/Materials for Teaching Middle/Secondary English. 3 Credits.
Various teaching methods, strategies, and materials used in teaching middle and secondary school English. For English education majors only. Prerequisites: T&L 250 and T&L 345. Corequisite: T&L 486. F.

ENGL 427. Scholarly Editing. 3 Credits.
An exploration of the history of the book, practice in preparing specialized texts for presentation in print and online, and experience working with authors, editors, and university presses and academic journals. S, even years.

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 429. Studies in Writing and Editing. 3 Credits.
A course for advanced students on topics in Writing and Editing, varying from year to year. 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.

ENGL 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. Repeatable to 9 credits. F,S.

Entrepreneurship (ENTR), School of
http://business.und.edu/entr/

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 and opportunities. 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>
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</thead>
<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>
<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>
<tr>
<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>
<td>1</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>6</td>
</tr>
<tr>
<td>&amp; MATH 146</td>
<td>and Applied Calculus I</td>
<td></td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</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>
<td>3</td>
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<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td></td>
</tr>
</tbody>
</table>


III. College of Business and Public Administration requirements (see BPA I. Essential Studies Requirements (see University ES listing). Which must be from a 4-year institution) including:

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be approved by the School of Entrepreneurship before the student can be required courses, you are required to submit a Statement of Educational and Life Objectives (SELO) and to seek other knowledge, credentials (degrees, majors, minors, etc.).

III. Graphic Design Technology Major Program Requirement, at least a 2.50 GPA in courses that apply toward the degree and major.

Certificate for Non-Business Majors

ENTR 101 Introduction to Entrepreneurship 3
ISBC 260 Digital Technology for Entrepreneurs 3
ENTR 250 Imagination, Creativity and Entrepreneurial Thinking 3
ENTR 290 Venture Initiation 3
MRKT 311 Professional Selling 3
ENTR 316 Entrepreneur Law & Operations 3
ENTR 386 Entrepreneurship: The Numbers 3
ENTR 388 Entrepreneurship: The Money 3
ENTR 390 Venture Implementation 3
ENTR 490 Entrepreneurship Senior Seminar 2
ENTR 497 Entrepreneurship Practice 3

Total Credits 84

Entrepreneurship Track for Business Majors

ENTR 250 Imagination, Creativity and Entrepreneurial Thinking 3
ENTR 290 Venture Initiation 3
ENTR 386 Entrepreneurship: The Numbers 3

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 (p. 600) listing) and including:

ACCT 200 Elements of Accounting I 3
& ACCT 201 and Elements of Accounting II 3
ACCT 315 Business Law I 3
COMM 110 Fundamentals of Public Speaking 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
FIN 310 Principles of Financial Management 3
ISBC 117 Personal Productivity with Information Technology 3
ISBC 217 Fundamentals of Computer Information Systems 3
MATH 103 College Algebra 3
MATH 146 Applied Calculus I 3
MGMT 300 Principles of Management 3

MGMT 301 Operations Management 3
MGMT 475 Strategic Management 3
MRKT 305 Marketing Foundations 3
POL 115 American Government I 3
PSYC 111 Introduction to Psychology 3

Total Credits 55

III. Information Systems Major Courses:

TECH 230 User Experience and Interface Design 3
TECH 232 Web Design 3
ISBC 300 Application Development 3
ISBC 330 Database Design 3
ISBC 340 Fundamentals of Networking 3
ISBC 370 Web Development 3
ISBC 410 Information Security 3
ISBC 490 Information Systems Analysis and Design Seminar 3
Electives at the 300+ level 6
Electives must be approved by the Chair

Total Credits 30

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 approved for a B.S. in Graphic Design Technology 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)

TECH 102 Digital Design Software 3
TECH 117 Personal Productivity with Information Technology 1
TECH 122 Computer-Aided Design 3
TECH 212 Visual Literacy 3
TECH 230 User Experience and Interface Design 3
TECH 232 Web Design 3
ISBC 330 Database Design 3
ISBC 322 Digital Photography Fundamentals 3
TECH 332 Industrial Design 3
ISBC 370 Web Development 3
TECH 422 Advanced Digital Photography and Imaging 3
Industrial Technology is a field of study designed to prepare technical 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</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>TECH 110</td>
<td>Fundamentals of Technology</td>
<td>2</td>
</tr>
<tr>
<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>
</tr>
<tr>
<td>TECH 223</td>
<td>Applied Synthetics</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 300</td>
<td>Application Development</td>
<td>3</td>
</tr>
<tr>
<td>TECH 300</td>
<td>Technology and Society</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>TECH 332</td>
<td>Industrial Design</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 386</td>
<td>Entrepreneurship: The Numbers</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 410</td>
<td>Marketing and Management Concepts for</td>
<td>3</td>
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<tr>
<td></td>
<td>Entrepreneurship</td>
<td></td>
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<tr>
<td>TECH 433</td>
<td>Manufacturing Strategies</td>
<td>3</td>
</tr>
<tr>
<td>TECH 440</td>
<td>Occupational Safety</td>
<td>3</td>
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<tr>
<td>TECH 498</td>
<td>Senior Capstone I</td>
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<tr>
<td>TECH 499</td>
<td>Senior Capstone II</td>
<td>3</td>
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</tbody>
</table>

Total Credits: 45

IV. The following 20 credits of Support Courses are required:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 105</td>
<td>Trigonometry</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I &amp; 121L</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 161</td>
<td>Introductory College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 162</td>
<td>Introductory College Physics II</td>
<td>4</td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic</td>
<td>3</td>
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<tr>
<td></td>
<td>Statistics</td>
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</tbody>
</table>

Total Credits: 20

Minor in Information Systems

22 semester hours, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Technology</td>
<td></td>
</tr>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Systems</td>
<td></td>
</tr>
<tr>
<td>TECH 232</td>
<td>Web Design</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
<td>3</td>
</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>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 22
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 will learn about "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 Courses

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 320. 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 meets business requirements, solve business problems, and address business opportunities in the desktop, mobile and/or Internet/intranet environments. Prerequisite: ISBC 117. 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.
and the interpreting technical drawings. S.

milling. Additional topics covered will include material testing and inspection, manufacturing processes such as casting, heat treatment, forming, turning, and connection to computer numerical control (CNC). The creation of presentation coordinates and layout, subsurface meshes, regions, solid modeling, and TECH 202. Advanced Application of CADD Techniques. 3 Credits.

You are introduced to computer-aided design/drafting using AutoCAD software and technical drawing techniques to include blueprint interpretation, various projections, ptiocertials, 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 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 222. 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.S.

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. U grading. F.S.S.

TECH 399. Honors Tutorial. 1-3 Credits.
An analysis of various methods employed in instructional techniques for industry and education. Development of methods and strategies of instruction with the resultant knowledge necessary to apply these principles and processes to appropriate applications. Prerequisites: TECH 122 and TECH 203, or equivalent. S.

TECH 400. Teaching Technology Education. 3 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.S.

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 212. 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, and TECH 330 or TECH 340. F, odd years.

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 Ultiboard 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 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. U grading. F.S.S.

TECH 497. Directed Studies in Technology. 1-8 Credits.
Projects selected to supplement the industrial project and the practical laboratory experiences with the resultant knowledge necessary to apply these principles and processes to appropriate applications. Prerequisites: TECH 122 and TECH 203, or equivalent. S.

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.

Family and Community Medicine (FMed)

http://www.med.und.edu/sports-medicine

Westereng (Chair), Bjerve, 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. Note: 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 preventive 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, 100 hours of directed observation, and completion of:

** FMED 101 Orientation to Athletic Training 1
** FMED 207 Prevention and Care of Athletic Injuries 2
** FMED 207L Laboratory Prevention and Care of Athletic Injuries 1
** BIOL 150 General Biology I 1
** 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 4
& 150L and General Biology I Laboratory 4

The student must earn a letter grade of B or better in the following courses to be admitted in the program.

** FMED 101 Orientation to Athletic Training 1
** FMED 207 Prevention and Care of Athletic Injuries 2
** FMED 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 & 121L General Chemistry I and General Chemistry I Laboratory "** 4
** COMM 110 Fundamentals of Public Speaking "** 3
** ENGL 110 College Composition I "** 3
** ENGL 130 Composition II: Writing for Public Audiences 3
** MED 205 Medical Terminology 1
** PHYS 161 Introductory College Physics I (includes lab) "** 4
** PHYS 162 Introductory College Physics II (includes lab) 4
** PSYC 111 Introduction to Psychology "** 3

PSYC 241 Introduction to Statistics "** 4
PSYC 250 Developmental Psychology "** 4
SOC 110 Introduction to Sociology "" 3
Arts & Humanities Requirement "" 9
Electives 16

Total Credits 61

"" indicates course satisfies Essential Studies Requirements.

**Professional Courses**

The following are essential professional courses to become an entry-level athletic trainer:

** ANAT 204 Anatomy for Paramedical Personnel 3
** FMED 205 Anatomy for Athletic Trainers 2
** FMED 208 Procedures in Athletic Training 1
** FMED 208L Laboratory Procedures in Athletic Training 1
** FMED 200 Understanding Medicine 3
** FMED 211 Beginning Clinical Practicum I in Athletic Training 1
** FMED 213 Beginning Clinical Practicum in Athletic Training 1
** FMED 311 Intermediate Clinical Practicum I in Athletic Training 2
** FMED 312 Medical Aspects of Sports 2
** FMED 313 Intermediate Clinical Practicum II in Athletic Training 2
** FMED 320 Athletic Training Modalities 2
** FMED 320L Laboratory Athletic Training Modalities 1
** FMED 321 Athletic Training Rehabilitation Techniques 2
** FMED 321L Laboratory Athletic Injury Rehabilitation Techniques 1
** FMED 343 Organizational Administration of Athletic Training 3
** FMED 411 Advanced Clinical Practicum I in Athletic Training 2
** FMED 413 Advanced Clinical Practicum II in Athletic Training 2
** FMED 481 Athletic Injury Assessment 4
** FMED 491 Seminar in Athletic Training 2
** FMED 497 Internship in Athletic Training 3
** NUTR 240 Nutrition 3
** KIN 332 Biomechanics 3
** KIN 402 Exercise Physiology 3
** PPT 301 Human Physiology 4
** PPT 320 Pharmacology in Sport 2

**Courses**

** FMED 101. Orientation to Athletic Training. 1 Credit.
Overview of the field of athletic training. Survey of the role of the athletic trainer. Films, lectures, and observation in clinical settings. F.S.

** FMED 200. Understanding Medicine. 3 Credits.
An overview of the broad parameters of family medicine. Guest speakers are brought in to discuss various facets of medicine. S.

** FMED 205. Anatomy for Athletic Trainers. 2 Credits.
A course to learn and palpate human anatomy structures and their functions. Prerequisite: Department consent. F.

** FMED 207. Prevention and Care of Athletic Injuries. 2 Credits.
An introductory course into the care and treatment of athletic injuries. Corequisite: FMED 207L. F.S.

** FMED 207L. Laboratory Prevention and Care of Athletic Injuries. 1 Credit.
A practical laboratory to develop athletic taping skills taught in FMED 207. Corequisite: FMED 207. F.S.

** FMED 208. Procedures in Athletic Training. 1 Credit.
This course serves as an orientation class for incoming sports health majors. Policies and procedures as well as record keeping are covered. Prerequisites: FMED 207 and FMED 207L. Corequisite: FMED 205 and FMED 208L. F.
**Finance (Fin)**

http://www.business.und.edu/finance

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 AACSBAccredited degree program.

B.B.A. with Major in Managerial Finance (p. )

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>
</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>and Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 315</td>
<td>Business Law I</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>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>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>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**FMED 208L.** Laboratory Procedures in Athletic Training. 1 Credit.
A course designed to allow students to get practical experiences in injury management, modality usage and record keeping skills taught in FMED 208. Prerequisites: FMED 207 and FMED 207L. Corequisite: FMED 205 and FMED 208F. F.

**FMED 211.** Beginning Clinical Practicum I in Athletic Training. 1 Credit.
A clinical course designed to allow students to develop specified clinical competencies in a directed, progressive manner. Prerequisites: FMED 101, FMED 207 and FMED 207L. Corequisite: FMED 208 and FMED 208L. F.

**FMED 213.** Beginning Clinical Practicum in Athletic Training. 1 Credit.
A clinical course designed to allow students to develop specified clinical competencies in a directed, progressive manner. Prerequisites: FMED 208 and FMED 208L. S.

**FMED 311.** Intermediate Clinical Practicum I in Athletic Training. 2 Credits.
A clinical course designed to allow students to develop specified clinical competencies in a directed, progressive manner. Prerequisites: FMED 208 and FMED 208L. S.

**FMED 312.** Medical Aspects of Sports. 2 Credits.
A course designed to introduce students to various medical specialties and medical problems and their effects on athletic participation. Prerequisite: Permission of instructor. F.

**FMED 313.** Intermediate Clinical Practicum II in Athletic Training. 2 Credits.
A clinical course designed to allow students to develop specified clinical competencies in a directed progressive manner. Prerequisite: FMED 213. F.

**FMED 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: FMED 481. S.

**FMED 320L.** Laboratory Athletic Training Modalities. 1 Credit.
A course designed to practice the theoretical and applied principles and techniques for the application of modalities in sports injury care. Prerequisite: FMED 481. Corequisite: FMED 320. S.

**FMED 321.** Athletic Training Rehabilitation Techniques. 2 Credits.
A course designed to explain the principles and techniques of rehabilitation as they apply to athletic injuries. Prerequisite: FMED 481. Corequisite: FMED 321L. S.

**FMED 321L.** Laboratory Athletic Injury Rehabilitation Techniques. 1 Credit.
A course designed to allow students practical skill development of rehabilitation techniques utilized in athletic injury care as taught in FMED 321. Prerequisite: FMED 481. Corequisite: FMED 321L. S.

**FMED 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.

**FMED 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: FMED 313F.

**FMED 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: FMED 313. S.

**FMED 481.** Athletic Injury Assessment. 4 Credits.
A course designed to instruct the student in the theories and skills of injury evaluation. Prerequisite: FMED 213. F.

**FMED 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.

**FMED 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.

**FMED 497.** Internship in Athletic Training. 3 Credits.
Off campus athletic training experience designed to expose the student to alternate concepts of care. Repeatable up to 6 credits with instructor permission. Prerequisite: FMED 313. Repeatable to 6 credits. F,S,S.
MGMT 301 Operations Management 3
FIN 310 Principles of Financial Management 3
MGMT 475 Strategic Management 3
MRKT 305 Marketing Foundations 3
POL 115 American Government I 3
COMM 110 Fundamentals of Public Speaking 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 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

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 Elements of Accounting II 6
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
POL 115 American Government I 3
COMM 110 Fundamentals of Public Speaking 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 55

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 50 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.S.

FIN 350. Financial Statement Analysis. 3 Credits.
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 multi-national 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.unl.edu/dept/forensic/
Ovtchinnikov and Stubblefield (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 criministics 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 backgound 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: the following curriculum:

69 Major Credits including:

<table>
<thead>
<tr>
<th>Required Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 345</td>
<td>Forensic Science 3</td>
</tr>
<tr>
<td>ANTH 346</td>
<td>Analysis of Forensic Evidence 3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking 3</td>
</tr>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice 3</td>
</tr>
<tr>
<td>CJ 210</td>
<td>Introduction to Policing 3</td>
</tr>
<tr>
<td>CJ 342</td>
<td>Criminal Procedure 3</td>
</tr>
<tr>
<td>CJ 352</td>
<td>Criminal Investigation 3</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I 4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>and General Biology I Laboratory 4</td>
</tr>
<tr>
<td>BIOL 151</td>
<td>General Biology II 4</td>
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<tr>
<td>&amp; 151L</td>
<td>and General Biology II Laboratory 4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I 6</td>
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<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II 6</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory 2</td>
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<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory 2</td>
</tr>
<tr>
<td>CHEM 340</td>
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<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry 4</td>
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<td>&amp; 333L</td>
<td>and Analytical Chemistry Laboratory 4</td>
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<tr>
<td>PHYS 161</td>
<td>Introductory College Physics I 4</td>
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<tr>
<td>&amp; PHYS 161L</td>
<td>and Introductory College Physics I 4</td>
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<tr>
<td>PHYS 162</td>
<td>Introductory College Physics II 4</td>
</tr>
<tr>
<td>&amp; PHYS 162L</td>
<td>and Introductory College Physics II 4</td>
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<td>Select one of the following:</td>
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<tr>
<td>BIOL 470</td>
<td>Biometry 3</td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics 3</td>
</tr>
<tr>
<td>Select one of the following:</td>
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<tr>
<td>PHIL 120</td>
<td>Introduction to Ethics 3</td>
</tr>
<tr>
<td>PHIL 250</td>
<td>Ethics in Engineering and Science 3</td>
</tr>
<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care 3</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

| Total Credits   | 69 |

III. Evidence Analyst Track: the following curriculum:

98 Major Credits including:

<table>
<thead>
<tr>
<th>Required Courses</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ANTH 345</td>
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<td>General Biology II 4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>and General Biology II Laboratory 4</td>
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<td>and General Chemistry II Laboratory 4</td>
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<td>&amp; 333L</td>
<td>and Analytical Chemistry Laboratory 4</td>
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<td>and Organic Chemistry I Laboratory 5</td>
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<td>CHEM 342</td>
<td>Organic Chemistry II 5</td>
</tr>
<tr>
<td>&amp; 342L</td>
<td>and Organic Chemistry II Laboratory 5</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I 4</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II 4</td>
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<tr>
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<td>SOC 326</td>
<td>Sociological Statistics 3</td>
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<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care 3</td>
</tr>
<tr>
<td>Select two of the following:</td>
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<tr>
<td>PHYS 161</td>
<td>Introductory College Physics I 8</td>
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<tr>
<td>&amp; PHYS 161L</td>
<td>and Introductory College Physics I 8</td>
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<tr>
<td>PHYS 162</td>
<td>Introductory College Physics II 8</td>
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<tr>
<td>&amp; PHYS 162L</td>
<td>and Introductory College Physics II 8</td>
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<tr>
<td>Select one of the following:</td>
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<td>Ethics in Health Care 3</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

| Total Credits   | 133 |
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 or above) 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</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 121 &amp; 121L</td>
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<tr>
<td>GEOG 151</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 161</td>
<td>3</td>
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<tr>
<td>GEOG 377 &amp; 377L</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 454</td>
<td>3</td>
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<td>GEOG 471 &amp; 471L</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 474 &amp; 474L</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 22

*A: 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:

- GEOG 352 Economic Geography 3
- GEOG 457 Urban Geography and Planning 3
- GEOG 458 Community Development 3
- Electives * 5

 Electives *:

- GEOG 250 Introduction to Geopolitics
- GEOG 262 Geography of North America I
- GEOG 263 Geography of North Dakota
- GEOG 300 Special Topics in Geography
- GEOG 322 Environmental Hazards
- GEOG 374 & 374L Environmental Remote Sensing and Environmental Remote Sensing Laboratory
- GEOG 378 Global Positioning Systems: Applications and Theory
- GEOG 397 Cooperative Education
- GEOG 452 Selected Topics in Economic Geography
- GEOG 453 Historical Geography
- GEOG 455 Geopolitics
- GEOG 459 Population Geography
- GEOG 463 Regional Geography
- GEOG 476 Selected Topics in Geographic Information Systems

Required in other departments ** 12

Total Credits: 32

* 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 * 8

- GEOG 134 Introduction to Global Climate
- GEOG 134 & 134L Introduction to Global Climate Laboratory
- GEOG 334 Climatology
- GEOG 322 Environmental Hazards
- GEOG 421 Selected Topics in Physical Geography

Other electives ** 6

- GEOG 352 Economic Geography
- GEOG 374 Environmental Remote Sensing
- GEOG 374 & 374L Environmental Remote Sensing Laboratory
- GEOG 378 Global Positioning Systems: Applications and Theory
- GEOG 397 Cooperative Education
- GEOG 457 Urban Geography and Planning
- GEOG 475 Digital Image Processing
- GEOG 476 Selected Topics in Geographic Information Systems

Required in other departments *** 12

Total Credits 26

* Elective systematic courses chosen in consultation with the faculty adviser (at least 8 credits).

** Other electives chosen in consultation with the faculty adviser (6 credits)

*** Any combination of courses from the following fields: Atmospheric Science, Biology, Chemistry, Computer Science, Civil Engineering, Geology and Geological Engineering, Math, and Physics.

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 listing).

II. Geographic Education Program of Study:

A. Geographic Education core (26 credits):

- GEOG 121 Global Physical Environment 4
- & 121L and Global Physical Environment Laboratory
- GEOG 151 Human Geography 3
- GEOG 161 World Regional Geography 3
- GEOG 271 The Power of Maps 3
- GEOG 352 Economic Geography 3
- GEOG 377 Quantitative Applications in Geography 3
- & 377L and Spatial Analysis Laboratory
- GEOG 386 Geography Education Field Placement 1
- GEOG 419 Methods and Materials of Teaching Middle and Secondary School in Geographic Education 3
- GEOG 454 Conservation and Sustainable Use of Natural Resources 3

Total Credits 26

B. Electives (10 credits):

Students must choose a minimum of 10 credits from a combination of the following concentrations, selected with approval of the geography adviser responsible for teacher education.

Human Geography

- GEOG 250 Introduction to Geopolitics 3
- GEOG 300 Special Topics in Geography 1-3
- GEOG 452 Selected Topics in Economic Geography 3-9
- GEOG 453 Historical Geography 3
- GEOG 455 Geopolitics 3
- GEOG 457 Urban Geography and Planning 3
- GEOG 458 Community Development 3
- GEOG 459 Population Geography 3

Physical Geography

- GEOG 134 Introduction to Global Climate 4
- & 134L and Introduction to Global Climate Laboratory
- GEOG 300 Special Topics in Geography 1-3
- GEOG 322 Environmental Hazards 3
- GEOG 334 Climatology 3
- GEOG 421 Selected Topics in Physical Geography 3-9

Regional Geography

- GEOG 262 Geography of North America I 3
- GEOG 263 Geography of North Dakota 3
- GEOG 262 Geography of Canada 3
- GEOG 462 Geography of North America II 3
- GEOG 463 Regional Geography 2-9

Geographical Techniques

- GEOG 374 Environmental Remote Sensing 3
- & 374L and Environmental Remote Sensing Laboratory
- GEOG 378 Global Positioning Systems: Applications and Theory 2
- GEOG 471 Cartography and Visualization 3
- & 471L and Cartography and Visualization Laboratory
- GEOG 474 Introduction to Geographic Information Systems (GIS) 3
- & 474L and GIS Laboratory

III. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (p. 604) for admission and licensing requirements.)

IV. The program in Secondary Education, to include:

- T&L 250 Introduction to Education 3
- 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 (Optional) 1
- GEOG 419 Methods and Materials of Teaching Middle and Secondary School in Geographic Education 3
- T&L 432 Learning Environments 3
- T&L 433 Multicultural Education 3
- T&L 486 Field Experience 1
- T&L 487 Student Teaching 16
- T&L 488 Senior Seminar 1

Total Credits 39

Geography majors seeking secondary licensure must have a geography education adviser in the Geography Department and an adviser in the Department of Teaching and Learning.

* T&L 390 Special Topics, may be taken as an elective.

Minor in Geography

Required 20 credits including:

- GEOG 121 Global Physical Environment 4
- & 121L and Global Physical Environment Laboratory
- GEOG 151 Human Geography 3
- GEOG 161 World Regional Geography 3
with a global economy. F. contributions of the diverse peoples who inhabit the two nation-states and deal emphasizes the transformation of the cultural landscape by exploring the challenges that face the world today. S.

Perspectives to the analysis of global and regional issues and events, and social issues relevant to mapping, as well as a survey of map application. S, even years.

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, climate, landforms, vegetation, and soils. F, S, SS.

Geography and Geographic Information Science (Geog)

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.

The geography courses that may be used to satisfy the 9-credit Essential Studies 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 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.

GEOG 262. Geography of North America I. 3 Credits. A spatial approach to the development of Canada and the United States which emphasizes the transformation of the cultural landscape by exploring the contributions of the diverse peoples who inhabit the two nation-states and deal with a global economy. F.

GEOG 270. Introduction to Geospatial Technologies. 3 Credits. Students engage with a range of geospatial technologies to explore, analyze, and represent geographical phenomena and data through a series of field-based exercises. Students will learn about the types of societal problems that geospatial scientists are uniquely positioned to solve. Through guest speakers, readings, and discussions, they will learn about the knowledge and skills required to enter this rapidly-expanding career field and the courses in the geography curriculum that will help them to acquire these skills. F.

GEOG 271. The Power of Maps. 3 Credits. Maps are essential and powerful tools for those who study geographical phenomena. Improvements in GIS and the World Wide Web (WWW) have empowered more people to make and use maps in highly varied and creative ways. This course serves as an introduction to maps and cartography, with emphasis on their role in GIS and on the WWW. Course content includes the characteristics of geographic data, the map abstraction and generalization process, map types and uses, and map interpretation. The course covers technical and social issues relevant to mapping, as well as a survey of map application. S, even years.

GEOG 274. Introduction to Geospatial Technologies. 3 Credits. Students engage with a range of geospatial technologies to explore, analyze, and represent geographical phenomena and data through a series of field-based exercises. Students will learn about the types of societal problems that geospatial scientists are uniquely positioned to solve. Through guest speakers, readings, and discussions, they will learn about the knowledge and skills required to enter this rapidly-expanding career field and the courses in the geography curriculum that will help them to acquire these skills. F.

GEOG 300. Special Topics in Geography. 1-3 Credits. Topic of course will change from semester to semester but will typically emphasize recent developments in geography. Repeatable to six credits. Repeatable to six credits. F, S, SS.

GEOG 314. Conservation Of Resources. 3 Credits.

GEOG 322. Environmental Hazards. 3 Credits.

GEOG 334. Climatology. 3 Credits. An overview of the field of climatology emphasizing risk assessment, hazard impacts, human vulnerability, and hazard mitigation. Prerequisites: GEOG 121 and GEOG 161 or consent of instructor. F, even years.

GEOG 352. Economic Geography. 3 Credits. A study of the local, national, and global economic life describing and explaining the geographic factor involved in the production, distribution, and consumption of the major commodities and resources of the world. Special emphasis is placed upon the global issue of the underdeveloped or Third World countries and theories, which have been, developed to explain spatial structure. Prerequisite: Sophomore standing or consent of instructor. F.

GEOG 362. Geography of Canada. 3 Credits. A regional and topical analysis of the physical, cultural and economic features of Canada. S.

GEOG 374. Environmental Remote Sensing. 2 Credits. A thorough examination of optical, infrared, and microwave methods for remote observation of Earth systems, with a focus on the use of aircraft and satellite data for addressing environmental problems. The course includes an overview of modern remote sensing systems for data collection at a variety of scales, as well as an introduction to digital image processing. Corequisite: GEOG 374L. F.

GEOG 374L Environmental Remote Sensing Laboratory. 1 Credit. A systematic coverage of visual and digital laboratory techniques used to observe Earth systems, with a focus on the use of aircraft and satellite data for addressing environmental problems. The course includes an overview of modern remote sensing systems for data collection at a variety of scales, as well as an introduction to digital image processing. Corequisite: GEOG 374. F.

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 378. 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 386. Geography Education Field Placement. 1-3 Credits.
A variable credit course with amount of credit depending upon the extent of the geographic education work of the student in a K-12 school setting. Recommended for secondary education social studies majors interested in how geography is taught at the high school level and for elementary/secondary school social studies majors concerned about how federal legislation is affecting teaching grades K-8. Prerequisite: Department approval. Repeatable. F, S, SS.

GEOG 397. Cooperative Education. 1-6 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. F, S, SS.

GEOG 419. Methods and Materials of Teaching Middle and Secondary School in Geographic Education. 3 Credits.
Various teaching methods, strategies and the materials used in teaching middle and secondary school geographic education. Prerequisites: T&L 250 and T&L 345. Corequisite: T&L 486. S.

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 454. 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 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 262 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. F.

GEOG 458. 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 459. 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 462. 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 463. 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 471. 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 471L. 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 474. 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 474L. 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 475. 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 476. Selected Topics in Geographic Information Systems. 3 Credits.
An examination of a specific application area or set of techniques in GIS including, but not limited to, Business GIS, Environmental GIS, GIS Databases, GIS Scripting and Web-Based GIS. Repeatable to six credits if different topics are examined. Prerequisites: GEOG 474 and GEOG 474L, or instructor consent. Repeatable to 3 credits. On demand.

GEOG 494. Directed Studies in Geographical Problems. 1-3 Credits.
Designed for students who wish to explore advanced topics in Geography on an individual or small group basis. May be repeated to a maximum of six credit hours. Prerequisites: Upper division status and consent of instructor. Repeatable to 6 credits. F, S, SS.

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, LeFever, Mahmood, Matheney, Nordeng, Perkins, Pulkonen and Wang
The Harold Hamm School of Geology and Geological Engineering offers Bachelor of Science degrees in Geology, Geological Engineering, and Environmental Geoscience, Bachelor of Arts with Geology, the Master of Arts and Master of Science degrees in Geology, the Master of Science degree in Geologic Engineering, the Doctor of Philosophy degree in Geologic 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 Arts with a Major in Geology, 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 Arts (B.A) degrees in Geology are taught in the School, but the degrees are awarded through the College of Arts and Sciences.

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.

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 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.

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 a 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.

Teacher Certification (p. ) B.A. with Major in Geology (p. ) B.S. in Geological Engineering (p. ) B.S. in Environmental Geoscience (p. )

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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<td>&amp; 101L</td>
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<tr>
<td>GEOL 102</td>
<td>4</td>
<td>The Earth Through Time</td>
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<tr>
<td>&amp; 102L</td>
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<td>and The Earth Through Time Laboratory</td>
</tr>
<tr>
<td>GEOL 256</td>
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<td>Critical Thinking in the Geosciences</td>
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<td>GEOL 311</td>
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<td>Geomorphology</td>
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<td>GEOL 318</td>
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<td>Mineralogy</td>
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<td>GEOL 320</td>
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<td>Petrology</td>
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<td>GEOL 356</td>
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<td>Geoscience Lectures</td>
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<td>GEOL 411</td>
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<td>GEOL 420</td>
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<td>GEOL 422</td>
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<td>Seminar II</td>
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<td>GEOL 487</td>
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<td>Research I</td>
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<td>GEOL 488</td>
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<td>GEOL 494</td>
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Field Geology (Summer; not available at UND) 6

Select two of the following: 6-7

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<td>GEOL 414</td>
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<td>Applied Geophysics</td>
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<td>GEOL 415</td>
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<td>Introduction to Paleontology</td>
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<td>GEOL 417</td>
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<td>Hydrogeology</td>
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Required in other departments

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<td>CHEM 121</td>
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<td>and General Chemistry II</td>
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<tr>
<td>&amp; CHEM 122L</td>
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<td>and General Chemistry II Laboratory</td>
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<tr>
<td>ENGL 110</td>
<td>3</td>
<td>College Composition I</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>3</td>
<td>Composition II: Writing for Public Audiences</td>
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<td>MATH 165</td>
<td>8</td>
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<tr>
<td>&amp; MATH 166</td>
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<td>and Calculus II</td>
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<td>PHYS 211</td>
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<td>College Physics I</td>
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<td>&amp; PHYS 211L</td>
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<td>and University Physics I</td>
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<tr>
<td>or PHYS 251</td>
<td>3</td>
<td>and General Chemistry I</td>
</tr>
<tr>
<td>&amp; PHYS 251L</td>
<td></td>
<td>and General Chemistry I Laboratory</td>
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<tr>
<td>PHYS 212</td>
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Select one of the following:

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<td>MATH 321</td>
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<td>Applied Statistical Methods</td>
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<tr>
<td>PSYC 241</td>
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<td>Introduction to Statistics</td>
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</table>

Departmentally approved courses in engineering, mathematics, foreign language, and other fields of student interest 22-24

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. 238) 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>
<thead>
<tr>
<th>Course</th>
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<td>and General Chemistry I Laboratory</td>
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<td>ENGR 200</td>
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Second Semester

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<td>Statics</td>
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<td>MATH 166</td>
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<td>GEOE 301</td>
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<td>Petrophysics</td>
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<td>PHYS 251</td>
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Sophomore Year

First Semester

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<td>ME 341</td>
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Second Semester

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<tr>
<td>ENGL 130</td>
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<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>ENGR 203</td>
<td>3</td>
<td>Mechanics of Materials</td>
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<tr>
<td>EE 206</td>
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<td>Circuit Analysis</td>
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<tr>
<td>or ENGR 202</td>
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<td>or Dynamics</td>
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<tr>
<td>MATH 266</td>
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<td>Elementary Differential Equations</td>
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<td>GEOL 330</td>
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Junior Year

First Semester

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<td>ENGR 460</td>
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<td>GEOE 417</td>
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<td>Hydrogeology</td>
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<td>Arts &amp; Humanities Elective</td>
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<td>ECON 210</td>
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<td>Introduction to Business and Economic Statistics</td>
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<td>or Applied Statistical Methods</td>
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Second Semester

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<tr>
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<tbody>
<tr>
<td>GEOL 411</td>
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<td>GEOE 323</td>
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<td>Communication Elective</td>
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Credits 14-15
Summer
Geological Engineering Field Camp (South Dakota School of Mines and Technology Black Hills Field Camp) 6

<table>
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<th>Senior Year</th>
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<td>First Semester</td>
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<tr>
<td>GEOL 414</td>
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<td>GEOE 455</td>
<td>Geomechanics II 4</td>
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<td>GEOE 484</td>
<td>Geological Engineering Design 3</td>
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<td>Technical Elective *</td>
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| Second Semester | |
| CHE 340 | Professional Integrity in Engineering 3 |
| or PHIL 250 | or Ethics in Engineering and Science |
| GEOE 485 | Geological Engineering Design 3 |
| Technical Elective * | 3 |
| GEOL 422 | Seminar II 1 |
| Arts and Humanities Elective | 3 |
| Arts and Humanities or Social Science Elective | 3 |

| Credits | 15-16 |
| Total Credits | 128-130 |

* Technical Electives: 8 credits required from courses approved by Geological Engineering Curriculum Committee.

Students may substitute Geology lecture series (GEOL 356 Geoscience Lectures, GEOL 421 Seminar I, GEOL 422 Seminar II) with COMM 110 Fundamentals of Public Speaking (ES=O)

### Approved Technical Electives for Geological Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 414</td>
<td>Foundation Engineering</td>
<td>3</td>
</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>GEOL 302</td>
<td>Reclamation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 351</td>
<td>Petroleum Development Engr</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 418</td>
<td>Hydrogeological Methods</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 419</td>
<td>Groundwater Monitoring and Remediation</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 425</td>
<td>Design Hydrology for Wetlands</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 427</td>
<td>Groundwater Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 493</td>
<td>Selected Topics in Geological Engineering</td>
<td>1-3</td>
</tr>
<tr>
<td>GEOL 311</td>
<td>Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 321</td>
<td>Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 407</td>
<td>Petroleum Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 491</td>
<td>Geologic Problems (only section)</td>
<td>1-4</td>
</tr>
<tr>
<td>PTRE 311</td>
<td>Petroleum Fluid Properties</td>
<td>3</td>
</tr>
<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>
</tr>
<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:

#### 41 major hours including:

<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>4</td>
</tr>
<tr>
<td>&amp; 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOE 203</td>
<td>Earth Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 203L</td>
<td>and Earth Dynamics Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 103</td>
<td>Introduction to Environmental Issues</td>
<td>3</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>
<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 321</td>
<td>Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 322</td>
<td>Geology, Society, and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 342</td>
<td>Environmental and Conservation Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 356</td>
<td>Geoscience Lectures</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 414</td>
<td>Applied Geophysics</td>
<td>3</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>
</tr>
<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>
</tr>
<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>
</tr>
</tbody>
</table>

#### 28 hours required in other departments:

<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>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>and General Biology I Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>and General Biology II Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 332</td>
<td>General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 332L</td>
<td>and Gen Ecology Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 122L</td>
<td>and General Chemistry II Laboratory</td>
<td></td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>
II. The following curriculum:

I. Essential Studies requirements (see University ES listing) which must be from a 4-year institution) including:

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

**College of Arts and 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td>4</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>4</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>2</td>
</tr>
<tr>
<td>GEOL 420</td>
<td>Geology Capstone</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 422</td>
<td>Seminar II</td>
<td>1</td>
</tr>
<tr>
<td>Geology Electives (300 level and above)</td>
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<td>13</td>
</tr>
</tbody>
</table>

Required in other departments

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 122</td>
<td>and General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>&amp; CHEM 122L</td>
<td>and General Chemistry II Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 105</td>
<td>Trigonometry</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>College Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 211L</td>
<td>and</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 212</td>
<td>and College Physics II</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 212L</td>
<td>and</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

- Level IV proficiency in a foreign language and six hours of Social Sciences and Arts beyond the University requirement
- Level II proficiency in a foreign language and 14 hours of Social Sciences and Arts beyond the University requirement
- Social Sciences and Arts beyond the University requirement

Total Credits 111-115

Program Electives

Select four courses from the following list: 12-14

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 431</td>
<td>Wildlife Management</td>
<td></td>
</tr>
<tr>
<td>BIOL 433</td>
<td>Aquatic Ecology</td>
<td></td>
</tr>
<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry</td>
<td></td>
</tr>
<tr>
<td>GEOE 323</td>
<td>Engineering Geology</td>
<td></td>
</tr>
<tr>
<td>GEOE 417</td>
<td>Hydrogeology</td>
<td></td>
</tr>
<tr>
<td>GEOG 334</td>
<td>Climatology</td>
<td></td>
</tr>
<tr>
<td>GEOG 374</td>
<td>Environmental Remote Sensing</td>
<td></td>
</tr>
<tr>
<td>&amp; 374L</td>
<td>and Environmental Remote Sensing Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 410</td>
<td>Site Characterization</td>
<td></td>
</tr>
<tr>
<td>LAW 263</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHIL 253</td>
<td>Environmental Ethics</td>
<td></td>
</tr>
<tr>
<td>SPST 430</td>
<td>Earth System Science</td>
<td></td>
</tr>
<tr>
<td>Statistics (PSYC 241, BIOL 470, ECON 210, or MATH 321)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Other Approved Electives</td>
<td></td>
<td>24-26</td>
</tr>
</tbody>
</table>

Total Credits 120-127

Non specified electives approved by adviser 7

Total Credits 127-134

Minor in Geology

Required: 20 credits including:

Select two of the following: 7-8

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td></td>
</tr>
<tr>
<td>&amp; 101L</td>
<td>and Introduction to Geology Laboratory</td>
<td></td>
</tr>
<tr>
<td>or GEOE 203</td>
<td>Earth Dynamics</td>
<td></td>
</tr>
<tr>
<td>GEOL 102</td>
<td>The Earth Through Time</td>
<td></td>
</tr>
<tr>
<td>&amp; 102L</td>
<td>and The Earth Through Time Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 103</td>
<td>Introduction to Environmental Issues</td>
<td></td>
</tr>
<tr>
<td>GEOL 111</td>
<td>Views of Earth and Planets</td>
<td></td>
</tr>
<tr>
<td>GEOL 311</td>
<td>Geomorphology</td>
<td></td>
</tr>
<tr>
<td>GEOL 322</td>
<td>Geology, Society, and the Environment</td>
<td></td>
</tr>
</tbody>
</table>

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.

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.

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.

GEOL 301. Petrophysics. 3 Credits.
Mineral and rock formation, identification and petrophysical properties, particularly with respect to porous rocks and their interactions with fluids. Prerequisite: GEOL 203. Corequisite: GEOL 301L. F.

GEOL 301L. Petrophysics Laboratory. 1 Credit.
Laboratory to accompany GEOL 301. Prerequisite: GEOL 203. Corequisite: GEOL 301. F.

GEOL 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 GEOL 203 or consent of instructor. S.

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. Prerequisites: GEOL 100, 101, 102 or consent of the instructor. Repeatable to 8 credits. F,S.

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 GEOL 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 GEOL 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 geochemistry, 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; misuse and repair 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.

GEOE 302. Earth Dynamics. 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: 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. Environmental and Conservation 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. F.

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 GEOL 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 GEOL 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 animals 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: GEOL 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, GEOL 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 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 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. 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 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 GEOL 417. S.

GEOL 427. Groundwater Modeling. 3 Credits.
Fundamentals of numerical modeling applied to groundwater flow. Short programs using the finite difference method will be written to demonstrate groundwater movement and storage. Simulation of practical groundwater problems will be carried out using the U.S. Geological Survey’s MODFLOW code. Prerequisites: GEOL 417 and MATH 265; some programming experience is recommended. F.

GEOL 455. Geomechanics. 3 Credits.
Principles of geomechanics and its application to petroleum and geological engineering. Prerequisites: GEOL 323 or consent of instructor. F.

GEOL 455L. Geomechanics Laboratory. 1 Credit.
Laboratory to accompany GEOL 455. Prerequisites: GEOL 323 or consent of instructor. Corequisite: GEOL 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 GEOL 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 GEOL 422 Seminar. Prerequisite: GEOL 484. Corequisite: GEOL 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 advisor 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 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: GEOL 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. 4 Credits.
Application of geological and environmental principles to geotechnical engineering design, construction, and operation. Prerequisites: One introductory geology course, MATH 165 and upper division standing in geology or engineering. On demand.

GEOE 351. Petroleum Development Engr. 3 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.
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.

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.

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. GEOL 104 also introduces the tools of the geologist -- minerals, rocks, maps, and aerial photographs. Emphasis on the environmental applications of these processes. GEOL 101L may be taken concurrently. F.S.S.

GEOL 105. 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 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 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.

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. Prerequisites: GEOL 100, 101, 102 or consent of the instructor. Repeatable to 8 credits. F.S.

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 GEOL 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 GEOL 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; misuse and repair 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.

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. Environmental and Conservation 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. F.

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.

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.S.

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:
9 credits from HIST 101, HIST 102, HIST 103, HIST 104, HIST 105, HIST 106
9
HIST 240 The Historian's Craft 3
HIST 347 Seminar 3
HIST 440 Research Capstone 3
6 Credits from North American History Selection 6
6 Credits from European History Selection 6
<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HIST 101. Western Civilization I. 3 Credits.</td>
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<tr>
<td>An interpretive survey of Western Civilization from earliest times to the close of the European Middle Ages. F.S.</td>
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<tr>
<td>HIST 102. Western Civilization II. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 103. United States to 1877. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 104. United States since 1877. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 105. World Civilizations I. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 106. World Civilizations II. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 204. Canada to 1867. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 205. Canada since 1867. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 210. United States Military History. 3 Credits.</td>
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<tr>
<td>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 influences of the Army on American society. Specific wars and battles are studied in terms of military tactics and strategy. F.</td>
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<tr>
<td>HIST 220. History of North Dakota. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 230. History of Modern Science. 3 Credits.</td>
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<tr>
<td>An introductory survey of the origins and development of modern western science from the Renaissance to the present. Course themes will include the history of the scientific worldview, the early modern Scientific Revolution, the institutional and social contexts of western science, and the histories of particular issues in the life and physical sciences. F.</td>
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<tr>
<td>HIST 240. The Historian's Craft. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 250. The Civil Rights Movement. 3 Credits.</td>
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<tr>
<td>This course examines the &quot;long&quot; 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.</td>
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<tr>
<td>HIST 260. Slaves, Citizens and Social Change. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 269. World War II. 3 Credits.</td>
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<tr>
<td>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.</td>
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<tr>
<td>HIST 300. Topics in History. 1 Credit.</td>
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<tr>
<td>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. F.S.</td>
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</table>

### Option B

**39 Major hours, including:**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>HIST 101</td>
<td>United States to 1877.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 102</td>
<td>Western Civilization II.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>World Civilizations I.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 104</td>
<td>World Civilizations II.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 105</td>
<td>World Civilizations III.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 106</td>
<td>World Civilizations IV.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 204</td>
<td>Canada to 1867.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 205</td>
<td>Canada since 1867.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 210</td>
<td>United States Military History.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 220</td>
<td>History of North Dakota.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 230</td>
<td>History of Modern Science.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 240</td>
<td>The Historian's Craft.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 250</td>
<td>The Civil Rights Movement.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 260</td>
<td>Slaves, Citizens and Social Change.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 269</td>
<td>World War II.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 300</td>
<td>Topics in History.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Credits:** 39

### Minor in History

21 credits required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 240</td>
<td>The Historian's Craft.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>No more than 9 credits of 100 and/or 200 level classes</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>At least 9 credits of 300 and/or 400 level classes</td>
<td>9</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>HIST 330</td>
<td>The United States: Social and Cultural, 19th Century</td>
<td>3</td>
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<tr>
<td>PHIL 300</td>
<td>Ancient Philosophy</td>
<td>3</td>
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<tr>
<td>PHIL 301</td>
<td>Medieval Philosophy</td>
<td>3</td>
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<tr>
<td>PHIL 302</td>
<td>Renaissance and Enlightenment</td>
<td>3</td>
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<td>PHIL 303</td>
<td>Kant and the Nineteenth Century</td>
<td>3</td>
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<td>PHIL 312</td>
<td>American Philosophy</td>
<td>3</td>
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<tr>
<td>ART 210</td>
<td>History of Art I</td>
<td>3</td>
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<tr>
<td>&amp; ART 211</td>
<td>History of Art II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 39

**Required in other departments:**

- A minor, second major, or teaching certification
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 statuses, 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 339. 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 347. Seminar. 3 Credits.
This class reinforces the skills introduced in HIST 240 through intensive student-centered approach to the study of the past. The class centers upon refining individual skills in informational literacy, critical thinking and both written and oral communication through a series of focused readings, discussions and projects. Prerequisite: HIST 240. F.S.

HIST 349. War in Early Modern Europe. 3 Credits.
The course examines the "modern military revolution"--the advent of firearms and professional armies--and the effects upon European politics, economics, culture and thought, from the end of the middle ages through the French Revolution. S, odd years.

HIST 350. Europe: The Reformation, 1500-1648. 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 351. Europe: Age of Absolutism, 1648-1789. 3 Credits.
The flow of events and ideas in Europe from the end of the Thirty Years' War to the French Revolution. S, odd years.

HIST 352. The French Revolution and Napoleon, 1789-1815. 3 Credits.
The central political event of modern European history and the classic revolution, the French Revolution unleashed social and political forces that have influenced France and much of the rest of the world ever since. It moved by stages, from monarchy to republic to emperor, from moderation to Terror to Napoleon Bonaparte. Napoleon ruled over an empire larger than those of Alexander the Great or the Romans, and his Code Napoleon has served as the model for law codes in counties the world over. On demand.

HIST 353. Europe in the Nineteenth Century, 1815-1918. 3 Credits.
Europe was transformed by industrial and scientific achievements in the 19th century. People in many European countries saw their capacities in transportation, communication, production, manufacture, and weaponry multiplied many times over. The accumulated energy generated by these achievements was released in the Great War 1914-1918, which ended Europe's domination of the world. On demand.

HIST 355. Europe since 1918. 3 Credits.
When the 20th century began, Europe was the acknowledged center of the world. But 400 years of European global supremacy ended with the Great War of 1914-1918. Its aftermath was marked by the greatest tragedies in human history. Following the even more global and more terrible Second World War, European nations created the European Union. Can the EU withstand the stresses to which it is being subjected?. On demand.

HIST 362. Modern China. 3 Credits.
A survey of the political, economic, social, and intellectual history of China from the Opium War (1842) until the present. Special attention will be paid to the problems of modernization in traditional societies and to the nature of fundamental social revolution.

HIST 370. African-American History to 1877. 3 Credits.
This course begins 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. Du Bois. 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 travails 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 391. The Invention of Latin American. 3 Credits.
This course explores the history of Latin America from 1492 through the mid-19th Century. It focuses on lasting legacies of conquest and colonization that give rise to the notion of a "Latin" America that is linguistically, culturally, and ethnically distinct from an "Anglo" America in the northern part of the hemisphere. Emphasis will be placed upon formulations of culture and race as they relate to the emergence of Latin American national identities. On demand.

HIST 397. Cooperative Education. 3 Credits.
A practical work experience with an employer closely associated with the student's academic area. 3 credits repeatable to 9. Arranged by mutual agreement among student, department, and employer. May be repeated to a maximum of 9 credits. Repeatable to 9 credits. S/U grading. F, S, SS.

HIST 399. Selected Topics in History. 2-3 Credits.
Selected topics in history which allow the student to study a specialized subject. Credits may apply to history major or minor. Repeatable to 30 credits. F, S.

HIST 402. British North America. 3 Credits.
This course explores the Colonial (1607-1763) and Revolutionary (1763-1789) era of American history. It focuses upon the interactions that occurred between the indigenous and immigrant, both free and unfree, populations within British North America and how cultural interaction and trade influenced colonial development. It ends by exploring the causes and consequences of the American Revolution. F.

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 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, 1884-1945. 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 deconstruction 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 horrid 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, ethnic-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.
A mixture of lectures, discussion, projects, and writing assignments. History 440 requires students to design and conduct a major research project on a topic of their choice. 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.
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:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>HT 360</td>
<td>Histopathology Laboratory Theory *</td>
<td>3</td>
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<tr>
<td>HT 362</td>
<td>Histotechniques I *</td>
<td>3</td>
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<tr>
<td>HT 363</td>
<td>Histotechniques II *</td>
<td>3</td>
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<td>HT 367</td>
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<td>HT 368</td>
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<td>Total Credits</td>
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* 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 of 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. 1-4 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. 1-4 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. 1-4 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,SS.

HON 489. Senior Honors Thesis. 1-9 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,SS.

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. 151) listing for more information.

Courses

HUM 101. Introduction to Humanities I. 4 Credits.
This course is designed to introduce beginning university students to the major disciplines of the Humanities: literature, philosophy, history, religion, drama, music, and art. The literature chosen for this course will require students to compare and contrast ancient and modern ideas in the major disciplines of the Humanities. Class time will be used to discuss the texts and students will be expected to attend events in the fine arts. F.S.S.

HUM 101L. Humanities Recitation.

HUM 102. Introduction to Humanities II. 4 Credits.
While this course has the same structure and goals as Humanities 101, its subject matter will focus more carefully on chosen genres, themes or time periods. The literature chosen for this course will require students to compare and contrast ancient and modern ideas in the major disciplines of the Humanities. Class time will be used to discuss the texts and students will be expected to attend events in the fine arts. F.S.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 Humanities 224: Integrated Social Science. 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. S.

HUM 270. Integrated Studies Life Sciences. 3 Credits.
An exploration of historical and modern developments in evolution and genetics that have altered our conception of what it means to be human. This course examines the philosophical, psychological, and sociological implications of contemporary neo-Darwinian thought. No laboratory. F.S.

HUM 271. Integrated Studies General Science. 3 Credits.
An exploration of the nature of science, with the aim of discovering how scientists employ powerful epistemological methods in order to construct a body of cumulative knowledge that represents a fairly accurate, although always tentative, approximation of external reality. This course examines the inextricable conceptual connections which link and unify seemingly disparate sciences. F.S.

HUM 271L. Integrated Studies General Science Laboratory. 1 Credit.
Three-hour weekly laboratory to complement HUM 271. Students will design and implement experiments. Prerequisite or corequisite: HUM 271. F.S.

HUM 283. Integrated Source Analysis. 1-4 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 forums of writing 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 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.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 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 team-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>
</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)**

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) Integrated Studies (http://und-public.coursesleaf.com/undergraduateacademicinformation/departmentalcoursesprograms/integratedstudies) B.A. or B.S.; 2) Women and Gender Studies (http://und-public.coursesleaf.com/undergraduateacademicinformation/departmentalcoursesprograms/womenandgenderstudies) B.A.; 3) Peace Studies (http://und-public.coursesleaf.com/undergraduateacademicinformation/departmentalcoursesprograms/peacestudies) B.A.; and 4) Customized Plan of Study B.A. or B.S.

The Integrated Studies Pathway is built on the foundation of the successful Humanities and Integrated Studies program for first-year students. 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:

- IDS 280 Learning Across Disciplines 3
- IDS 491 Capstone Interdisciplinary Seminar (not repeatable) 1-3
- IDS 498 Senior Project (repeatable to 6) 3

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 488. 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
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 Code</th>
<th>Course 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 Code</th>
<th>Course 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.

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
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<td>Diversity in Global Literatures</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 242</td>
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</tr>
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<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>

**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 common core of courses with one option: teacher education (Option A), which leads to a certification to teach physical education in grades K-12; related area (Option B), which allows a student to study kinesiology and a related subdiscipline; kinesiology applications area (Option C) for those students who wish to find employment in 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 355</td>
<td>Applied Motor Development</td>
<td>3</td>
</tr>
<tr>
<td>KIN 400 &amp; 400L</td>
<td>Methods and Materials for Teaching Physical Education Elementary School and Methods and Materials for Teaching Physical Education in the Elementary School - Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>KIN 404</td>
<td>Adapted Physical Activity</td>
<td>3</td>
</tr>
<tr>
<td>KIN 410 &amp; 410L</td>
<td>Methods and Materials for Teaching Physical and Health Education in the Secondary School and Methods and Materials for Teaching Physical &amp; Health Education in the Secondary School-Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>KIN 491</td>
<td>Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>KIN 495</td>
<td>Service Learning in KIN</td>
<td>2</td>
</tr>
<tr>
<td>KIN 496</td>
<td>Field Study in KIN</td>
<td>1-8</td>
</tr>
<tr>
<td>KIN 497</td>
<td>Internship in KIN</td>
<td>10</td>
</tr>
<tr>
<td>KIN 498</td>
<td>Practicum in Coaching</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching (Option A students only)</td>
<td>4-16</td>
</tr>
</tbody>
</table>

* Courses which may involve contact with P-12 students or vulnerable populations.

B.S. Public Health Education (B.S.P.H.E.) (p. 604).

**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. 604) 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 11S & 115L Introductory Chemistry 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 | 5 |
   PPT 301 Human Physiology | 4 |

**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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>KIN 276 &amp; 276L</td>
<td>Motor Learning and Motor Learning Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
</tr>
<tr>
<td>KIN 332 &amp; 332L</td>
<td>Biomechanics and Biomechanics Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>KIN 355</td>
<td>Applied Motor Development</td>
<td>3</td>
</tr>
<tr>
<td>KIN 401</td>
<td>Sport Sociology</td>
<td>3</td>
</tr>
<tr>
<td>KIN 402 &amp; 402L</td>
<td>Exercise Physiology and Exercise Physiology Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>KIN 404</td>
<td>Adapted Physical Activity</td>
<td>3</td>
</tr>
<tr>
<td>KIN 440</td>
<td>Sport Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>Course</th>
<th>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 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>KIN 220-238</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>KIN 290</td>
<td>Physical Education Activities for the Elementary Grades</td>
<td>3</td>
</tr>
<tr>
<td>KIN 327</td>
<td>Fitness for Life</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 400</td>
<td>Methods and Materials for Teaching Physical Education Elementary School</td>
<td>2</td>
</tr>
<tr>
<td>KIN 400L</td>
<td>Methods and Materials for Teaching Physical Education in the Elementary School - Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>KIN 403</td>
<td>School Health Education</td>
<td>2</td>
</tr>
<tr>
<td>KIN 410</td>
<td>Methods and Materials for Teaching Physical and Health Education in the Secondary School</td>
<td>2</td>
</tr>
<tr>
<td>KIN 410L</td>
<td>Methods and Materials for Teaching Physical &amp; Health Education in the Secondary School-Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>KIN 420</td>
<td>Curriculum Development for Physical and Health Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>KIN 491</td>
<td>Senior Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

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. 604) 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. Electives (a minimum of 8 credits from the following):

5. KIN 240 Introduction to Wellness 2

KIN 375 Fundamentals of Group Exercise Instruction 3

KIN 376 Professional Skills in Personal Training 3

KIN 434 Strength Training: Coaching Methods 2

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 & 1 team sport)

3. A pre-professional program in pre-med, pre-physical therapy, pre-occupational therapy, pre-chiropractic, pre-physician assistant or other 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 & 204L and Anatomy for Paramedical Personnel Laboratory 5

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:

BIOL 150 General Biology I & 150L and General Biology I Laboratory 4

CHEM 116 Introduction to Organic and Biochemistry & 116L and Introduction to Organic and Biochemistry Laboratory 4

CHEM 121 General Chemistry I & 121L and General Chemistry I Laboratory 4

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:

PHE 101 Introduction to Public Health 3

PHE 102 Epidemiology in Public Health 3

PHE 103 Introduction to Global Health 3

KIN 110 First Aid and CPR 1

KIN 240 Introduction to Wellness 2

NUTR 240 3

KIN 327 Fitness for Life 3

Total Credits 18

IV. One of the following options:

A. Public Health Education

PHE 301 Principles and Foundation of Health Education 3

PHE 302 Community Health 3

PHE 303 Organization and Administration of Community Health Programs 3

PHE 304 Health Program Planning and Implementation 3

PHE 305 Program Evaluation and Research Design 3

PHE 306 Epidemiology and Biostatistics 3

PHE 307 Methods and Materials of Health Education 3

PHE 415 Public Health Internship 15

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:

PSYC 210 Human Sexuality 3

SOC 335 The Family 3

KIN 207 Prevention and Care of Physical Activity Injuries 3

KIN 326 Fundamentals of Physical Conditioning 3

KIN 402 Exercise Physiology 3

KIN 402L Exercise Physiology Laboratory 1

KIN 403 School Health Education 2

KIN 404 Adapted Physical Activity 3

KIN 355 Applied Motor Development 3

PHE 302 Community Health 3

PHE 304 Health Program Planning and Implementation 3

PHE 305 Program Evaluation and Research Design 3

PHE 307 Methods and Materials of Health Education 3

KIN 420 Curriculum Development for Physical and Health Education 3

KIN 410 Methods and Materials for Teaching Physical and Health Education in the Secondary School 2

KIN 410L Methods and Materials for Teaching Physical & Health Education in the Secondary School-Laboratory 2

T&L 250 Introduction to Education 3

T&L 252 Child Development 3

T&L 339 Technology for Teachers 2

T&L 433 Multicultural Education 3

T&L 487 Student Teaching 16

T&L 488 Senior Seminar 1

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. 604) or on the Teacher Education website.) Note that many upper division courses are not open to students until they gain TE admission.

V. Electives Under Advisement, 23 credits, including:

Select courses that enhance your knowledge and skills for practicing in the public health setting, the worksite setting, the medical/clinic setting, and/or college/university setting.

ANTH 171 Introduction to Cultural Anthropology 3

ANTH 340 Medical Anthropology 3

ANTH 371 Cultural Dynamics 3
ANTH 465  Culture, Illness and Health  3
BIOL 470  Biometry  4
COMM 110  Fundamentals of Public Speaking  3
N&D 335  World Food Patterns  3
PPT 410  Drugs Subject to Abuse  2
PSYC 210  Human Sexuality  3
PSYC 250  Developmental Psychology  4
PSYC 361  Social Psychology  3
PSYC 355  Adulthood and Aging  3
PSYC 421  Diversity Psychology  3
KIN 326  Fundamentals of Physical Conditioning  3
KIN 403  School Health Education  2
SOC 352  Aging  3
SOC 355  Drugs and Society  3
SWK 313  Orientation to Gerontology  3

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:

KIN 241  Introduction to Coaching  1
KIN 207  Prevention and Care of Physical Activity Injuries  3
KIN 220-238  3
KIN 390  Introduction to Teaching in Physical Education and Coaching  2
KIN 390L  Introduction to Teaching in Physical Education and Coaching Laboratory  3
KIN 325  Youth and Children in Sport  3
KIN 326  Fundamentals of Physical Conditioning  3
KIN 341  Organization and Administration of Athletics  2
KIN 420-438 (3 courses that are 2 credits each to coincide with specific KIN 220-238 courses)  6
KIN 498  Practicum in Coaching  2

Total Credits  27

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
   PHE 302  Community Health
   PHE 303  Organization and Administration of Community Health Programs
   PHE 305  Program Evaluation and Research Design
   PHE 307  Methods and Materials of Health Education
   KIN 207  Prevention and Care of Physical Activity Injuries
   KIN 327  Fitness for Life
   KIN 403  School Health Education

NUTR 240  3
N&D 341  Community Nutrition I  3
SOC 352  Aging  3
SOC 355  Drugs and Society  3
SWK 315  Substance Use and Abuse  3
ANTH 171  Introduction to Cultural Anthropology  3
ANTH 465  Culture, Illness and Health  3
PPT 410  Drugs Subject to Abuse  3
PSYC 210  Human Sexuality  3
PSYC 250  Developmental Psychology  3
PSYC 361  Social Psychology  3
PSYC 355  Adulthood and Aging  3

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. Comitative 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 110. First Aid and CPR. 1 Credit.
Recommended First Aid and CPR practices for the care of persons who have been injured or suddenly become ill. F,S,SS.

KIN 111. Individual Sports/Activities I. 1 Credit.
These courses are designed for beginners. They include 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 112. Outdoor Pursuits I. 1 Credit.
These courses are designed for beginners. They include 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 113. Racquet Sports I. 1 Credit.
These courses are designed for beginners. They include 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 114. Strength Training I. 1 Credit.
These courses are designed for beginners. They include 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 115. Target Sports I. 1 Credit.
These courses are designed for beginners. They include instruction in various target sports (e.g., trapshooting, skeet, etc.). For specific course content, see the current schedule of classes. F,S,SS.

KIN 116. Team Sports I. 1 Credit.
These courses are designed for beginners. They include 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 117. Gymnastics I. 1 Credit.
These courses are designed for beginners. They include 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 118. Military Conditioning I. 1 Credit.
This course is designed for beginners. It includes instruction in military conditioning. On demand.

KIN 118A. Air Force Conditioning I. 1 Credit.
This course is designed for beginners, 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 (AFPFA): push-ups, sit-ups, a 1.5 mile run and waist measurement. F.

KIN 118B. Army Conditioning I. 1 Credit.
This course is designed for beginners, 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 180 points total, in three events of the Army Personal Fitness Test (APFT): push-ups, sit-ups and a two mile run. F.

KIN 124. Aquatics II. 1 Credit.
Prerequisite: KIN 104 in the same activity or consent of the instructor. These courses provide intermediate 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 125. Combative Sports II. 1 Credit.
Prerequisite: KIN 105 in the same activity or consent of the instructor. These courses provide intermediate 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 127. Dance II. 1 Credit.
Prerequisite: KIN 107 in the same activity or consent of the instructor. These courses provide intermediate 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 128. Fitness and Conditioning II. 1 Credit.
Prerequisite: KIN 108 in the same activity or consent of the instructor. These courses provide intermediate 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 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 pursuits 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: KIN 118 or consent of instructor. 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 (AFPFA): push-ups, sit-ups, a 1.5 mile run and waist measurement. F,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 to 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. F,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 pursuits 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 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 155. Target Sports III. 1 Credit.
Prerequisite: KIN 155 in the same activity or consent of the instructor. These courses provide advanced level instruction in various target 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 156. Team Sports III. 1 Credit.
Prerequisite: KIN 136 in the same activity or consent of the instructor. These courses provide intermediate level instruction in various team sports (e.g., 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 to achieve a minimum score of 180 points total, in four events of the Air Force Personal Fitness Assessment (AFPFA): 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 to 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,SS.

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 equivalent in same area. 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 area. 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 area. These courses focus on the development of performance, performance analysis and knowledge in various dance types (e.g., ballet, hip-hop, etc.). These are professional preparation courses for KIN majors. For specific course content, see the current schedule of classes.

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 area. 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 area. 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 area. 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 area. 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 area. 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 area. 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 area. 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 area. 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 areas 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 332L. 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., ballroom, 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 9 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. 1-8 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. 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 and 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 420-439 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 quantitative 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/promotion programs. Prerequisites: Public Health Education Major, PHE 101, and PHE 102. F.

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.

Languages: Department of Modern and Classical Languages & Literatures (Lang)

http://www.arts-sciences.und.edu/languages

Benoit, Berne, Boyd, Fleshman, Gjellstad, Knapp, Maury, Mosher, Ross, Routon, and Weatherly (Interim Chairperson)

The Department of Modern and Classical Languages and Literatures offers study in Chinese, French, German, Latin, Norwegian, and Spanish. See IS 250 Lakota Language I and IS 251 Lakota Languages II for study of Native American languages of North Dakota. Majors are offered in Chinese, Classical Studies, French, German, Norwegian, or Spanish. Minors are offered in Chinese Studies, Classical Studies, French, German, Norwegian, and Spanish.

Coursework is divided into Lower and Upper Divisions. Lower division courses introduce students to languages and cultures. They also satisfy general education requirements, as do select upper division courses. Upper division courses focus on literary, linguistic, theoretical and cultural studies and are taught in the target languages unless otherwise indicated.

The Department encourages international study through departmentally approved programs. It is recommended that students who are seeking credit for previous foreign study take the placement test. It also recommends students for various awards for superior academic performance, especially the Arneberg and the Larsen Foreign Travel Scholarships.

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 Essential Studies Requirement. See University ES listing.

Credit earned through College Level Examination Program (CLEP) tests may be recognized by UND. See CLEP (p. 40) 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.

B.A. with a Major in Chinese Studies (p. 162) B.A. with a Major in Classical Studies (p. 163) French (p. 162) German (p. 163) Norwegian (p. 163) Spanish (p. 164)

College of Arts and Sciences

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:

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

II. Major Curriculum Listed Under Specific Language.

College of Arts & Sciences

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</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<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>
<td>3</td>
</tr>
<tr>
<td></td>
<td>English courses beyond College Composition II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>10</td>
</tr>
</tbody>
</table>

III. Additional requirements for licensure in French, German or Spanish

Phonetics (with grade no lower than B) 2
Advanced Grammar (with grade no lower than B) 2
### 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).**

<table>
<thead>
<tr>
<th>Part A: Language requirement</th>
<th>**</th>
<th>Option 1, Latin</th>
<th>**</th>
<th>Option 2, Greek</th>
<th>**</th>
<th>Option 3, Greek and Latin</th>
</tr>
</thead>
<tbody>
<tr>
<td>**</td>
<td></td>
<td>CLAS 101</td>
<td>First Year Latin I</td>
<td>4</td>
<td>CLAS 151</td>
<td>First Year Greek I</td>
</tr>
<tr>
<td>**</td>
<td></td>
<td>CLAS 102</td>
<td>First Year Latin II</td>
<td>4</td>
<td>CLAS 152</td>
<td>First Year Greek II</td>
</tr>
<tr>
<td>**</td>
<td></td>
<td>CLAS 201</td>
<td>Second Year Latin I</td>
<td>4</td>
<td>CLAS 251</td>
<td>Second Year Greek I</td>
</tr>
<tr>
<td>**</td>
<td></td>
<td>CLAS 202</td>
<td>Second Year Latin II</td>
<td>4</td>
<td>CLAS 252</td>
<td>Second Year Greek II</td>
</tr>
</tbody>
</table>

**Part B: Courses in classical civilization, literature, culture**

Select seven of the following:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 185</td>
<td>Introduction to Classical Mythology</td>
<td>CLAS 211</td>
<td>Masterpieces Greek and Roman Literature in Translation</td>
<td>CLAS 262</td>
<td>Greek and Roman Epic in Translation</td>
<td>CLAS 304</td>
</tr>
<tr>
<td>CLAS 202</td>
<td>Ancient Roman</td>
<td>CLAS 311</td>
<td>Ancient Greek Theater</td>
<td>CLAS 364</td>
<td>Special Topics in Classical Literature</td>
<td>CLAS 365</td>
</tr>
<tr>
<td>CLAS 366</td>
<td>Ancient Rome</td>
<td>CLAS 367</td>
<td>The Ancient Near East</td>
<td>RELS 231</td>
<td>Introduction to Humanities II</td>
<td>RELS 300</td>
</tr>
<tr>
<td>CLAS 368</td>
<td>Ancient History</td>
<td>POLS 310</td>
<td>Introduction to Political Thought</td>
<td>PHIL 301</td>
<td>Medieval Philosophy</td>
<td>PHIL 301</td>
</tr>
<tr>
<td>HIST 101</td>
<td>Western Civilization I</td>
<td>RELS 321</td>
<td>Introduction to Christian Thought</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
<tr>
<td>HIST 343</td>
<td>Ancient Greece</td>
<td>RELS 347</td>
<td>Greek and Roman Epic in Translation</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
<tr>
<td>HIST 344</td>
<td>Ancient Rome</td>
<td>RELS 345</td>
<td>The Ancient Near East</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
<tr>
<td>HIST 345</td>
<td>The Ancient Near East</td>
<td>RELS 346</td>
<td>Ancient History</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
<tr>
<td>HUM 102</td>
<td>Introduction to Humanities II</td>
<td>RELS 347</td>
<td>Introduction to Christian Thought</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
<tr>
<td>PHIL 300</td>
<td>Ancient Philosophy</td>
<td>RELS 348</td>
<td>The Ancient Near East</td>
<td>RELS 328</td>
<td>Development of Christian Doctrine</td>
<td>RELS 328</td>
</tr>
</tbody>
</table>

**Part C | 6**

| LANG 380 | Global Gateways | LANG 480 | Capstone: Global Connections |

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
FREN 373 North American Francophone Cultures through
Literature and Film 3
FREN 491 Seminar in French and Francophone Studies 1-3
FREN 494 Individual French Readings 1-3

Category 3: the understanding and analysis of Francophone perspectives
regarding socio-cultural contemporary world issues
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
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
FREN 373 North American Francophone Cultures through
Literature and Film 3
FREN 491 Seminar in French and Francophone Studies 1-3
FREN 494 Individual French Readings 1-3

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

Upper-division courses (minimum 27 credit hours)
GERM 307 Communicating Cultures I 3
GERM 308 Communicating Cultures II 3
LANG 380 Global Gateways 3
LANG 480 Capstone: Global Connections 3

Electives
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

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 major. In
addition, at least six credit hours of course work in fields related to German
approved by the faculty adviser in Languages are required.

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

Required
LANG 380 Global Gateways 3
LANG 480 Capstone: Global Connections 3
Minor in Chinese Studies: Language and Culture

Required: 23 credits distributed between Parts A and B as follows:

**Part A: Language Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 101</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 102</td>
<td>4</td>
</tr>
</tbody>
</table>

**Part B: Area Studies**

Select five of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 201</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 202</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 303</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 305</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 306</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 405</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 406</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 362</td>
<td>3</td>
</tr>
<tr>
<td>RELS 315</td>
<td>3</td>
</tr>
<tr>
<td>RELS 380</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 383</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 463</td>
<td>3</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLAS 101</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 102</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 201</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 202</td>
<td>4</td>
</tr>
</tbody>
</table>

**Option 2, Greek**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 151</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 152</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 251</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 252</td>
<td>4</td>
</tr>
</tbody>
</table>

**Option 3, Greek and Latin**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 101</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 102</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 151</td>
<td>4</td>
</tr>
<tr>
<td>CLAS 152</td>
<td>4</td>
</tr>
</tbody>
</table>

**Part B**

Select four of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 185</td>
<td>3</td>
</tr>
<tr>
<td>CLAS 211</td>
<td>3</td>
</tr>
<tr>
<td>CLAS 262</td>
<td>3</td>
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<tr>
<td>CLAS 301</td>
<td>3</td>
</tr>
<tr>
<td>CLAS 311</td>
<td>3</td>
</tr>
<tr>
<td>CLAS 364</td>
<td>3</td>
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<tr>
<td>CLAS 404</td>
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</tr>
<tr>
<td>HIST 101</td>
<td>3</td>
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<tr>
<td>HIST 301</td>
<td>3</td>
</tr>
<tr>
<td>HIST 343</td>
<td>3</td>
</tr>
<tr>
<td>HIST 344</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 12

Minor in a Language

I. Minor curriculum listed under specific language.
Minor in French

A minor in French includes four introductory lower-division courses and a minimum of 14 credits at the 300 and 400 levels.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 101</td>
<td>First Year French I</td>
<td>4</td>
</tr>
<tr>
<td>FREN 102</td>
<td>First Year French II</td>
<td>4</td>
</tr>
<tr>
<td>FREN 201</td>
<td>Second Year French I</td>
<td>4</td>
</tr>
<tr>
<td>FREN 202</td>
<td>Second Year French II</td>
<td>4</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GERM 101</td>
<td>First Year German I</td>
<td>4</td>
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<tr>
<td>GERM 102</td>
<td>First Year German II</td>
<td>4</td>
</tr>
<tr>
<td>GERM 201</td>
<td>Second Year German I</td>
<td>4</td>
</tr>
<tr>
<td>GERM 202</td>
<td>Second Year German II</td>
<td>4</td>
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Upper-division courses (minimum 12 credit hours)

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GERM 307</td>
<td>Communicating Cultures I</td>
<td>3</td>
</tr>
<tr>
<td>GERM 308</td>
<td>Communicating Cultures II</td>
<td>3</td>
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</table>

Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GERM 304</td>
<td>German Phonetics: History, Dialect, and the Living Language</td>
<td>3</td>
</tr>
<tr>
<td>GERM 404</td>
<td>German Stories, German Histories</td>
<td>3</td>
</tr>
<tr>
<td>GERM 409</td>
<td>Madness and Genius: An Introduction to German Intellectual History</td>
<td>3</td>
</tr>
<tr>
<td>GERM 413</td>
<td>Advanced German Grammar Review</td>
<td>3</td>
</tr>
<tr>
<td>LANG 318</td>
<td>Individual Arranged Study Abroad</td>
<td>1-12</td>
</tr>
<tr>
<td>LANG 319</td>
<td>University Sponsored Study Abroad</td>
<td>1-12</td>
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</tbody>
</table>

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.

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.

Norwegian

A minor in Norwegian includes:

Four introductory courses

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>NORW 101</td>
<td>First Year Norwegian I</td>
<td>4</td>
</tr>
<tr>
<td>NORW 102</td>
<td>First Year Norwegian II</td>
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<tr>
<td>NORW 201</td>
<td>Second Year Norwegian I</td>
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<tr>
<td>NORW 202</td>
<td>Second Year Norwegian II</td>
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Upper division courses (minimum 12 credit hours)

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NORW 350</td>
<td>Norwegian Culture</td>
<td>3</td>
</tr>
<tr>
<td>NORW 403</td>
<td>Great Literary Works of Norway</td>
<td>3</td>
</tr>
<tr>
<td>NORW 431</td>
<td>Advanced Norwegian</td>
<td>3</td>
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<tr>
<td>NORW 432</td>
<td>Advanced Norwegian</td>
<td>3</td>
</tr>
<tr>
<td>NORW 433</td>
<td>Norwegian Literature</td>
<td>3</td>
</tr>
<tr>
<td>NORW 434</td>
<td>Norwegian Literature</td>
<td>3</td>
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</tbody>
</table>

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

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SPAN 101</td>
<td>First Year Spanish I</td>
<td>4</td>
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<tr>
<td>SPAN 102</td>
<td>First Year Spanish II</td>
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<tr>
<td>SPAN 201</td>
<td>Second Year Spanish I</td>
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<tr>
<td>SPAN 202</td>
<td>Second Year Spanish II</td>
<td>4</td>
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</table>

Required upper division courses (9 credits)

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SPAN 308</td>
<td>Spanish Conversation</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 309</td>
<td>Spanish Composition</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 462</td>
<td>Seminar in Hispanic Literature, Culture and Linguistics</td>
<td>3</td>
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</tbody>
</table>

One elective from the following (3 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SPAN 304</td>
<td>Spanish Phonetics</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 420</td>
<td>Early Spanish Literature &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 421</td>
<td>Modern &amp; Contemporary Spanish Literature &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 422</td>
<td>Early Latin American Literature &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 423</td>
<td>Modern &amp; Contemporary Latin American Literature &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 450</td>
<td>Advanced Spanish Grammar</td>
<td>3</td>
</tr>
</tbody>
</table>

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, 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. Grade of C or better is recommended. Prerequisite: CLAS 101. F,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 is recommended. Prerequisite: CLAS 151 recommended. S.

CLAS 153. Ancient Greek Theater. 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.
The 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 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 Homer's 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-philosophical, 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 384. 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 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 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 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 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 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 Québec 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 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 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 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. For major or minor credit, written work must be done in French. Prerequisite: FREN 202 with a grade of C or better, French placement exam or consent of instructor. On demand.

FREN 372. Studies in African, Asian, Caribban, 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. For major or minor credit, written work must be done in French. Prerequisite: FREN 202 with a grade of C or better, French placement exam or consent of instructor. 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. For major or minor credit written work must be done in French. Prerequisite: FREN 202 with a grade of C or better, French placement exam or consent of instructor. 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. For major or minor credit, written work must be done in French. May be repeated up to 12 credits. Prerequisite: FREN 202 with a grade of C or better, French placement exam or consent of instructor. Repeatable to 12 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 401. 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 Grimm’s 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 be. 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 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. Capstone: Global Connections. 3 Credits.
Open to majors and non-majors. Literature, linguistics and/or culture course organized by genre, movement, topic or period with a focus on promoting complex engagement with the subject through in-depth analytical writing and discussion. Taught in English. Prerequisite: Second semester Junior, or Senior status, or instructor approval.

LANG 489. Senior Honors Thesis. 1-15 Credits.
Supervised independent study culminating in a thesis. Repeatable to 15 credits. Prerequisites: Consent of Department and approval of the honors committee. F.S.

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.
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.

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 Literature. 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, even years.

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 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.
Pronunciation and fundamental grammatical principles introduced through the development of skill in 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 307. 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 307. 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 307. 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 307. On demand.

SPAN 450. Advanced Spanish Grammar. 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: Permission of instructor. 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/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 CoBPA 701.777.2975

LEAD 101 Learning Leadership 3
COMM 212 Interpersonal Communication 3
LEAD 400 Advanced Leadership 4

Select one of the following (Ethics):
PHIL 250 Ethics in Engineering and Science 3
PHIL 251 Ethics in Health Care
PHIL 252 Ethics in Business and Public Administration
PHIL 253 Environmental Ethics
RELS 342 Religious Ethics

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. Prerequisite: 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.

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 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:
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 2
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

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/fm-apply.cfm). 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.

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 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. Prerequisite: 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.

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:
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ENGL 418 Second Language Acquisition 2
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
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://www.business.und.edu/management
Chuang, Francis, Helleloid, Hollingworth (Chair), Jones, Nam, Schultz, Valentine and Vitton

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. Odégard 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. 173)
B.B.A. with a Major in Management (p. 174)
B.B.A. with a Major in Airport Management (p. 175)
B.B.A. with a Major in Aviation Management (p. 176)

Requirements for ALL Management Department Majors (p. 172)
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 indepth 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

<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>or ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
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</table>

Total Credits 6

CoBPA Pre-business Core Requirements:

<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>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>
<td>Applied Calculus I</td>
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Total Credits 25

CoBPA Requirements

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<th>Course</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>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>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</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 475</td>
<td>Strategic Management</td>
<td>3</td>
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Total Credits 24

Major Requirements

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<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>
<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>
</tr>
<tr>
<td>MGMT 410</td>
<td>Staffing: Recruitment and Selection</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 412</td>
<td>Training and Development</td>
<td>3</td>
</tr>
</tbody>
</table>

Major Elective Requirements

Select courses from the following list to complete the necessary elective credits: 11

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ECON 341</td>
<td>Labor Economics and Labor Relations</td>
<td></td>
</tr>
<tr>
<td>ISBC 305</td>
<td>End-User Applications</td>
<td></td>
</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>
<td></td>
</tr>
<tr>
<td>MGMT 397</td>
<td>Cooperative Education</td>
<td></td>
</tr>
<tr>
<td>MGMT 409</td>
<td>Union-Management Relations</td>
<td></td>
</tr>
<tr>
<td>MGMT 420</td>
<td>Multinational Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 431</td>
<td>Supply Chain Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 497</td>
<td>Internship in Management</td>
<td></td>
</tr>
<tr>
<td>PSYC 301</td>
<td>Industrial and Organizational Psychology</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credits 32

1. MATH 146 is used as a General Education requirement.
2. PSYC 301 is used as a General Education requirement.
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**: 9

**CoBPA Pre-business Core Requirements**:

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<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
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**Total Credits**: 16

**CoBPA Requirements**:

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<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>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 317</td>
<td></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>
</tbody>
</table>

**Total Credits**: 24

**Major Requirements**:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 310</td>
<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>

**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>
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<th>Credits</th>
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<tbody>
<tr>
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<tr>
<td>ISBC 320</td>
<td>Professional Communication for Business</td>
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<tr>
<td>LEAD 400</td>
<td>Advanced Leadership</td>
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</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits**: 17

**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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
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</table>

**Total Credits**: 6

**CoBPA Pre-business Core Requirements**:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
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<td>ACCT 200</td>
<td>Elements of Accounting 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>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
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<td>ECON 210</td>
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<td>MATH 103</td>
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<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
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**Total Credits**: 25

**CoBPA Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</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>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
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<td>MRKT 305</td>
<td>Marketing Foundations</td>
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<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
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</tr>
</tbody>
</table>
MGMT 475 Strategic Management 3  
Total Credits 24

**Major Requirements**

<table>
<thead>
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<th>Course</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Major Elective Requirements**

Select courses from the following list to complete the required number of elective credit hours:

- LEAD 400 Advanced Leadership 3
- MGMT 361 Alternative Dispute Resolution 3
- MGMT 362 Leadership and Conflict Resolution 3
- MGMT 395 Special Topics 3
- MGMT 397 Cooperative Education 3
- MGMT 407 Wage and Salary Administration 3
- MGMT 408 Issues in Human Resource Management 3
- MGMT 409 Union-Management Relations 3
- MGMT 410 Staffing: Recruitment and Selection 3
- MGMT 412 Training and Development 3
- MGMT 420 Multinational Management 3
- MGMT 431 Supply Chain Management 3
- MGMT 432 Supplier Relationship Management 3
- MGMT 433 Logistics in the Supply Chain 3
- MGMT 497 Internship in Management 3
- MRKT 315 Retail Management 3
- SPRT 330 Sport Law 3
- SPRT 450 Facility and Event Planning 3

Electives to total 125 credits.

Total Credits 32

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:**

See UND Essential Studies Requirements, current list of eligible courses, and consult with your adviser.

**Required courses**

<table>
<thead>
<tr>
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<tbody>
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<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 9

CoBPA Pre-business Core Requirements:

**Electives**

Add the following to the Pre-business “core” requirements

- ATSC 110 Meteorology I 3
- ATSC 110L Meteorology I Laboratory 1

**Aviation Courses**

- AVIT 100 Aviation Orientation 1
- AVIT 102 Introduction to Aviation 5
- AVIT 103 Introduction to Air Traffic Control 2
- AVIT 208 Aviation Safety 3
- AVIT 250 Human Factors 2
- AVIT 311 Safety Management System (SMS) 3
- AVIT 402 Airport Planning and Administration 3
- AVIT 403 Aerospace Law 3
- AVIT 442 Airport Operations and Administration 3
- AVIT 485 Aviation Senior Capstone 3
- GEOL 103 Introduction to Environmental Issues 3

Select one of the following:

- AVIT 405 Airline Operations and Management
- AVIT 407 General Aviation Operations and Management

**Advanced Business Courses**

- ISBC 305 End-User Applications 3
- MGMT 345 Human Resource Management 3
- MGMT 360 Organizational Behavior 3

Select one of the following:

- POLS 308 Intergovernmental Relations 3
- or POLS 404 Urban Politics and Administration 3
- or POLS 432 Public Policy Making Process 3

Electives to total 125 credits.

Total Credits 50

**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:**
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.

**Minor in Leadership**
(See separate listing under Leadership Minor (p. 170))

**Operations and Supply Chain Management Minor Requirements**

Students would be required to successfully complete all of the following courses, each of which is a 3-credit hour course.

- MGMT 301 Operations Management 3
- ISBC 317
- MGMT 309 Quantitative Methods for Managers 3
- MGMT 431 Supply Chain Management 3
- MGMT 432 Supplier Relationship Management 3
- MGMT 433 Logistics in the Supply Chain 3
- TECH 330 Quality Assurance 3
- MGMT 302 Human Resource Management 3 or MGMT 310 Organizational Behavior

**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, MGMT 310 Organizational Behavior and TECH 330 Quality Assurance) 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 317, 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 301 Operations Management, 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, Junior or Senior standing, a GPA of 2.5, and declared COBPA majors only. F.S.

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, MGMT 300, Sophomore standing or higher, 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, MGMT 301, 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, MGMT 300, 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 maximum 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 towards the above mentioned degree programs. Topics include: comparative system 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, Junior or Senior standing, and declared COBPA majors only. Prerequisite or Corequisite: MGMT 310. 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, 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, 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, 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, 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 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 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 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, MRKT 305, Junior or Senior Standing and 105 credits, and declared CoBPA majors only. F,S,SS.
II. The College of Business and Public Administration Requirements (see BPA
Required 125 credits (36 of which must be numbered 300 or above, and 60 of

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. 600) listing) and including:

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<tr>
<th>Course</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>and Elements of Accounting II</td>
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<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</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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<td>Select one of the following:</td>
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<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
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<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td></td>
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<td>SOC 110</td>
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Select five of the following*: 15

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>MRKT 311</td>
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<tr>
<td>MRKT 315</td>
<td>Retail Management</td>
<td></td>
</tr>
<tr>
<td>MRKT 340</td>
<td>Integrated Marketing Communications</td>
<td></td>
</tr>
<tr>
<td>MRKT 386</td>
<td>Field Experience in Marketing</td>
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<tr>
<td>MRKT 396</td>
<td>Directed Studies in Marketing</td>
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<tr>
<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>
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<td>MRKT 430</td>
<td>Relationship Marketing</td>
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<td>MRKT 433</td>
<td>Negotiations for Sales and Relationship Managements</td>
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<tr>
<td>MRKT 440</td>
<td>Special Topics in Marketing</td>
<td></td>
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<tr>
<td>MRKT 497</td>
<td>Internship in Marketing</td>
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</tbody>
</table>

Total Credits

* 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.

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.

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, Junior, or Senior 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 CBPA 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 CBPA 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, Junior or Senior 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.

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 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 497. Internship in Marketing. 1-8 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

Bevelacqua, Collings, Dearden, Dunnigan, Halcrow, Hong, J. liams (Chair), M. liams, Khavanin, Metzger, Millsbaugh, Minnolte, Peterson, Prescott, Richards, Takahashi and Zerr (Associate Chair)

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, mathematical statistics, mathematics in industry, mathematics in government and actuarial mathematics.

Students may pursue the B.S. degree with a major in mathematics through the College of Arts and Sciences. Teacher licensure is possible provided 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 102 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 Program (PTP).

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:

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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>12</td>
</tr>
<tr>
<td>&amp; MATH 166</td>
<td>and Calculus II</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 265</td>
<td>and Calculus III</td>
<td></td>
</tr>
<tr>
<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 488</td>
<td>Senior Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits**: 20

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:
   - MATH 330: Set Theory and Logic 3
   - MATH 403: Theory of Probability (if not used for category 3) 3
   - MATH 405: Selected Topics in Mathematics (pre-approval of topic required) 1-3
   - MATH 409: Geometry 3
   - MATH 431: Introduction to Analysis I 3
   - MATH 435: Theory of Numbers 3
   - MATH 441: Abstract Algebra 3
   - MATH 442: Linear Algebra 3

2. **Applications of Mathematics**: Courses where the emphasis is on applications of mathematics:
   - MATH 352: Introduction to Partial Differential Equations 3
   - MATH 412: Differential Equations 3
   - MATH 415: Topics in Applied Mathematics (pre-approval of topic required) 1-3
   - MATH 425: Cryptological Mathematics 3
   - MATH 460: Mathematical Modeling 3
   - MATH 461: Numerical Analysis 3
   - MATH 471: Introduction to Complex Variables 3

3. **Probability and Statistics**:
   - MATH 321: Applied Statistical Methods 3
   - MATH 403: Theory of Probability (if not used for category 1) 3
   - MATH 416: Topics in Statistics 1-3
   - MATH 421: Statistical Theory I 3

4. **Differential Calculus**:
   - MATH 321: Applied Statistical Methods 3
   - MATH 403: Theory of Probability (if not used for category 1) 3
   - MATH 416: Topics in Statistics 1-3
   - MATH 421: Statistical Theory I 3

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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 352</td>
<td>Introduction to Partial Differential Equations</td>
<td>6</td>
</tr>
<tr>
<td>&amp; MATH 412</td>
<td>and Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 403</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 416</td>
<td>and Topics in Statistics (pre-approval of topic in 416 required)</td>
<td></td>
</tr>
<tr>
<td>MATH 408</td>
<td>Combinatorics</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 425</td>
<td>and Cryptological Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 421</td>
<td>Statistical Theory I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 422</td>
<td>and Statistical Theory II</td>
<td></td>
</tr>
<tr>
<td>MATH 431</td>
<td>Introduction to Analysis I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 432</td>
<td>and Introduction to Analysis II</td>
<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>&amp; MATH 441</td>
<td>and Abstract Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 441</td>
<td>Abstract Algebra</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 442</td>
<td>and Linear Algebra</td>
<td></td>
</tr>
</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
   - b. **Probability and Statistics**: MATH 321 Applied Statistical Methods
   - 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. 604) for admission and licensing requirements.)

III. The program in Secondary Education (see Teaching & Learning (p. 238)):

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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; MATH 166</td>
<td>and Calculus II</td>
<td></td>
</tr>
</tbody>
</table>

Math electives numbered 207 or higher

**Total Credits**: 20

* not including MATH 217 Introduction to Cultural Mathematics, MATH 277 Mathematics for Elementary School Teachers, MATH 377 Geometry Elementary Teachers, MATH 400 Methods for Teaching Middle and Secondary Mathematics; Pedagogical Content Knowledge and MATH 477 Topics in Elementary School Mathematics.

Math 405 Selected Topics in Mathematics, MATH 415 Topics in Applied Mathematics, MATH 416 Topics in Statistics, MATH 494 Reading Course in Mathematics, and MATH 495 Readings in Mathematics may be used only with prior approval from the Mathematics Department.

Minor in Mathematics for Elementary Education

Required 20 credits of Mathematics, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Introduction to Mathematical Thought</td>
<td>3</td>
</tr>
<tr>
<td>MATH 277</td>
<td>Mathematics for Elementary School Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 377</td>
<td>Geometry Elementary Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 477</td>
<td>Topics in Elementary School Mathematics</td>
<td>3</td>
</tr>
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</table>

Select at least one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 208</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
</tbody>
</table>

All electives may be selected from Mathematics courses above Math 093.
### Minor in Statistics (Plan A)

**Prerequisites**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 165</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
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<td>MATH 265</td>
<td>Calculus III</td>
<td>4</td>
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**Required courses**

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>MATH 421</td>
<td>Statistical Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 422</td>
<td>Statistical Theory II</td>
<td>3</td>
</tr>
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</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 470</td>
<td>Biometry</td>
<td>3</td>
</tr>
<tr>
<td>EFR 513</td>
<td>Large Dataset Analysis</td>
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</tr>
<tr>
<td>EFR 514</td>
<td>Discourse Analysis</td>
<td></td>
</tr>
<tr>
<td>EFR 516</td>
<td>Statistics II</td>
<td></td>
</tr>
<tr>
<td>CHE 515</td>
<td>Design of Engineering Experiments</td>
<td></td>
</tr>
<tr>
<td>ECON 410</td>
<td>Empirical Methods in Economics I</td>
<td></td>
</tr>
<tr>
<td>EE 411</td>
<td>Communications Engineering</td>
<td></td>
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<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
<td></td>
</tr>
<tr>
<td>MATH 403</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>MATH 415</td>
<td>Topics in Applied Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 416</td>
<td>Topics in Statistics</td>
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<tr>
<td>PSYC 541</td>
<td>Advanced Univariate Statistics</td>
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<tr>
<td>PSYC 542</td>
<td>Multivariate Statistics for Psychology</td>
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<tr>
<td>PSYC 543</td>
<td>Experimental Design</td>
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<tr>
<td>SOC 521</td>
<td>Advanced Analytical Methods</td>
<td></td>
</tr>
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</table>

**Total Credits** 21

### Minor in Statistics (Plan B)

**Prerequisites**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Required courses**

<table>
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<tr>
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<th>Credits</th>
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</thead>
<tbody>
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<td>Biometry</td>
<td>4</td>
</tr>
<tr>
<td>EFR 513</td>
<td>Large Dataset Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EFR 514</td>
<td>Discourse Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EFR 516</td>
<td>Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>CHE 515</td>
<td>Design of Engineering Experiments</td>
<td>3</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>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td></td>
</tr>
<tr>
<td>PSYC 241</td>
<td>Introduction to Statistics</td>
<td></td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
<td></td>
</tr>
<tr>
<td>ECON 410</td>
<td>Empirical Methods in Economics I</td>
<td></td>
</tr>
<tr>
<td>EE 411</td>
<td>Communications Engineering</td>
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<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
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<tr>
<td>MATH 403</td>
<td>Theory of Probability</td>
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<tr>
<td>MATH 415</td>
<td>Topics in Applied Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 416</td>
<td>Topics in Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 421</td>
<td>Statistical Theory I</td>
<td></td>
</tr>
<tr>
<td>MATH 422</td>
<td>Statistical Theory II</td>
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<td>Advanced Univariate Statistics</td>
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<td></td>
</tr>
<tr>
<td>SOC 521</td>
<td>Advanced Analytical Methods</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 22

**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. 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. 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 and 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.**
An 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.
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 and developed them as they did. The course 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.
Introductory statistics for students with a background in single-variable calculus. Topics include descriptive statistics, continuous and discrete probability density functions, sampling distributions, point and interval estimation, and tests of hypotheses. Prerequisite: MATH 166. F,S.

MATH 330. Set Theory and Logic. 3 Credits.
Axioms and operations on sets, mathematical logic, relations and functions, development of the natural and real number systems, including field axioms and the completeness axiom for the real numbers. Prerequisite: MATH 166 or consent of instructor. F,S.

MATH 352. Introduction to Partial Differential Equations. 3 Credits.
Partial differential equations, Fourier series, special functions, series solutions to ordinary differential equations. Prerequisite: MATH 266. S.

MATH 377. Geometry Elementary Teachers. 1-3 Credits.
Experimental and inductive discovery in building geometric concepts at the elementary school level. Prerequisite: For elementary education majors only. On demand.

MATH 397. Cooperative Education. 1-8 Credits.
A practical work experience with an employer closely associated with the student's academic area. 1-8 credits repeatable to 18. Arranged by mutual agreement among student, department, and employer. A maximum of 18 credits for cooperative education credits may be applied against requirements for a Math major. Prerequisites: 15 completed credits in math including MATH 165, MATH 166, and MATH 265, in addition to standard co-op requirements (see department for approval). Repeatable to 18 credits. S/U grading. F,S,SS.

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 types 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 421. 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, Haghsenas, Johnson, McNally, Neubert, Semke (Chair), Stanlake, Tang, Yang and Zahi

Normal 0 false false EN-US X-NONE X-NONE /* Style Definitions */ table.MsoNormalTable {mso-style-name:"Table Normal"; mso- tstyle-rowband- size:0; mso-tstyle-colband-size:0; mso-style-noshow:yes; mso-style-priority:99; mso-style-parent:""; mso-padding-alt:0in 5.4pt 0in 5.4pt; mso-para-margin-top:0in; mso-para-margin-right:0in; mso-para-margin-bottom:10.0pt; mso-para-margin-left:0in; line-height:115%; mso-pagination:widow-orphan; font-size:11.0pt; font-family:"Calibri","sans-serif"; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin;}

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 intertwined 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. 607) 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>&amp; ME 488</td>
<td>and Engineering Design</td>
<td></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>
</tr>
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<tbody>
<tr>
<td>CHEM 121</td>
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</tr>
<tr>
<td>CHEM 121L</td>
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<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>ME 101</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</td>
<td>4</td>
</tr>
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</table>

Arts and Humanities | 3

Credits | 17

Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGR 200</td>
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<tr>
<td>ENGL 130</td>
</tr>
<tr>
<td>MATH 166</td>
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<tr>
<td>PHYS 251</td>
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</table>

Arts and Humanities | 3

Credits | 16

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGR 201</td>
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</tr>
<tr>
<td>ME 201</td>
<td>2</td>
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<tr>
<td>ME 341</td>
<td>3</td>
</tr>
<tr>
<td>MATH 265</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>4</td>
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</tbody>
</table>

Credits | 16

Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGR 202</td>
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<tr>
<td>ENGR 203</td>
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<tr>
<td>ENGR 206</td>
</tr>
<tr>
<td>MATH 266</td>
</tr>
<tr>
<td>PHYS 253 or CHEM 122/122L</td>
</tr>
</tbody>
</table>

Credits | 16

Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ME 301</td>
<td>3</td>
</tr>
<tr>
<td>ME 306</td>
<td>3</td>
</tr>
<tr>
<td>ME 322</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 460</td>
<td>3</td>
</tr>
</tbody>
</table>

Technical Elective | 3

Credits | 15

Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 323</td>
</tr>
<tr>
<td>ME 323L</td>
</tr>
<tr>
<td>ME 418</td>
</tr>
<tr>
<td>ME 474</td>
</tr>
<tr>
<td>MATH 321</td>
</tr>
</tbody>
</table>

Credits | 15

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

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ME 424</td>
</tr>
<tr>
<td>ME 425</td>
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<tr>
<td>ME 429</td>
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<td>ME 439</td>
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<td>ME 484</td>
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<td>ME 485</td>
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<td>ME 523</td>
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<td>ME 526</td>
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<tr>
<td>ME 529</td>
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<tr>
<td>ME 532</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ME 342</td>
</tr>
<tr>
<td>ME 446</td>
</tr>
<tr>
<td>ME 449</td>
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<tr>
<td>ME 451</td>
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<tr>
<td>ME 464</td>
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<td>ME 476</td>
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<tr>
<td>ME 477</td>
</tr>
<tr>
<td>ME 485</td>
</tr>
<tr>
<td>ME 542</td>
</tr>
</tbody>
</table>
### Mechanical Engineering (ME)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 545</td>
<td>Fluidized-Bed Combustion Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 574</td>
<td>Advanced Heat Transfer (#)</td>
<td>3</td>
</tr>
<tr>
<td>ME 575</td>
<td>Conduction and Radiation Heat Transfer (#)</td>
<td>3</td>
</tr>
<tr>
<td>ME 576</td>
<td>Convective Heat Transfer (#)</td>
<td>3</td>
</tr>
</tbody>
</table>

#### 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 313</td>
<td>Material Properties and Selection</td>
<td>3</td>
</tr>
<tr>
<td>ME 420</td>
<td>Composite Materials (#)</td>
<td>3</td>
</tr>
<tr>
<td>ME 428</td>
<td>Advanced Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 439</td>
<td>Introduction to Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ME 524</td>
<td>Deformation and Fracture (#)</td>
<td>3</td>
</tr>
<tr>
<td>ME 525</td>
<td>Metal Fatigue in Engineering (#)</td>
<td>3</td>
</tr>
<tr>
<td>ME 542</td>
<td>Thermodynamics of Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

#### 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. 6

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 590 Special Topics may also be included in the aerospace group at the discretion of the Mechanical Engineering Chair.

#### 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 CAD/CAM 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 training 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 materials, 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.

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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.
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.S.

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 203 with a grade of C 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 200 with a grade of C or better, MATH 166 with a grade of C or better, 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 considerations of engine components. Prerequisites: ME 316 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 topics include 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 a 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, 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 two 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:

Freshman Year
First Semester
ENGL 110 College Composition I 3

186 Medical Laboratory Science (MLS)
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
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<td>MATH 103</td>
<td>College Algebra</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>General Chemistry II and General Chemistry II Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<td>General Biology II</td>
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<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
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<td>MLS 101</td>
<td>Orientation to Medical Laboratory Sciences</td>
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<td>COMM 212</td>
<td>Interpersonal Communication</td>
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<td>MBIO 202</td>
<td>Introductory Medical Microbiology Lecture</td>
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<td>&amp; 234L</td>
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<td>MLS 340</td>
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<td>MLS 380</td>
<td>Professional Issues in Clinical Laboratory Science</td>
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<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>Arts &amp; Humanities (Humanities Category)</td>
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<td>MLS 472</td>
<td>Pre-analytical Skills</td>
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<td>MLS 473</td>
<td>Clinical Hemostasis I</td>
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<td>MLS 474</td>
<td>Clinical Urinalysis I</td>
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<td>MLS 477</td>
<td>Clinical Immunohematology I</td>
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<td>MLS 477L</td>
<td>Clinical Immunohematology I Lab</td>
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<td>MLS 478</td>
<td>Clinical Microbiology</td>
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<td>MLS 479</td>
<td>Clinical Hematology I</td>
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<td>MLS 480</td>
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<td>MLS 481</td>
<td>Clinical Chemistry II</td>
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<td>MLS 483</td>
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<td>MLS 484</td>
<td>Clinical Microbiology II</td>
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<td>MLS 487</td>
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<td>MLS 490</td>
<td>Financial and Quality Management of the Clinical Laboratory</td>
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<td>MLS 495</td>
<td>Clinical Microbiology II</td>
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<td>MLS 498</td>
<td>Clinical Hematology III</td>
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<td>Credits</td>
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<tr>
<td>Total Credits</td>
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</tr>
</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**

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<tr>
<th>Course Code</th>
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<td>General Chemistry</td>
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<td>Organic Chemistry</td>
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<td>Biochemistry</td>
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<td>General Biology</td>
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<td>Microbiology</td>
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<td>Anatomy</td>
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<td>Physiology</td>
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<tr>
<td>MLS 234</td>
<td>Human Parasitology</td>
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<td>MLS 301</td>
<td>Immunology</td>
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<tr>
<td>MLS 325</td>
<td>Hematology</td>
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<tr>
<td>MLS 325L</td>
<td>Hematology Laboratory</td>
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<tr>
<td>MLS 336</td>
<td>Laboratory Calculations (Recommended)</td>
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<tr>
<td>MLS 340</td>
<td>Molecular Diagnostics</td>
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<tr>
<td>Total Credits</td>
<td></td>
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</tbody>
</table>

* Available online from the MLS Program

**Offered as an intensive laboratory on campus in May**

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 examination and become a certified Medical Laboratory Scientist.

When a student is registered in 300 and 400 level MLS courses, a specific MLS tuition is assessed.

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 Chemistry/Urinalysis; Hematology/Hemostasis; Immunohematology; and Microbiology.

Upon successful completion of one categorical category, the student is eligible to complete the ASCP (American Society of Clinical Pathology) national certification exam in the specific categorical area. If the student completes all four categorical categories, the student is eligible to complete the ASCP national certification medical laboratory science (MLS) exam.

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>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLS 336</td>
<td>Laboratory Calculations 1</td>
</tr>
<tr>
<td>MLS 340</td>
<td>Molecular Diagnostics 2</td>
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<tr>
<td>MLS 460</td>
<td>Laboratory Practice 2</td>
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<tr>
<td>MLS 465</td>
<td>Clinical Laboratory Management 3</td>
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<tr>
<td>MLS 471</td>
<td>Clinical Chemistry I 2</td>
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<td>MLS 474</td>
<td>Clinical Urinalysis I 2</td>
</tr>
<tr>
<td>MLS 481</td>
<td>Clinical Chemistry II 2</td>
</tr>
<tr>
<td>MLS 485</td>
<td>Clinical Urinalysis II 1</td>
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<td>MLS 489</td>
<td>Clinical Body Fluids 1</td>
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<td>MLS 491</td>
<td>Clinical Chemistry III 2</td>
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Hematology/Hemostasis

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<tbody>
<tr>
<td>MLS 325</td>
<td>Hematology 3</td>
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<td>MLS 325L</td>
<td>Hematology Laboratory 2</td>
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<td>MLS 336</td>
<td>Laboratory Calculations 1</td>
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<tr>
<td>MLS 460</td>
<td>Laboratory Practice 2</td>
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<td>MLS 465</td>
<td>Clinical Laboratory Management 3</td>
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<td>MLS 473</td>
<td>Clinical Hemostasis I 2</td>
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<td>MLS 479</td>
<td>Clinical Hematology I 2</td>
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<td>MLS 483</td>
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<td>MLS 488</td>
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<td>Clinical Body Fluids 1</td>
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Immunohematology

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<td>Laboratory Practice 2</td>
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<td>MLS 465</td>
<td>Clinical Laboratory Management 3</td>
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<td>MLS 473</td>
<td>Clinical Hemostasis I 2</td>
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<td>MLS 477</td>
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Microbiology

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<tr>
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<tr>
<td>MLS 234</td>
<td>Human Parasitology 2</td>
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<tr>
<td>MLS 336</td>
<td>Laboratory Calculations 1</td>
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<td>MLS 340</td>
<td>Molecular Diagnostics 2</td>
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<tr>
<td>MLS 394</td>
<td>Medical Microbiology 2</td>
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<td>MLS 465</td>
<td>Clinical Laboratory Management 3</td>
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<tr>
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<td>MLS 495</td>
<td>Clinical Microbiology III 2</td>
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When a student is registered in 300 and 400 level MLS courses, a specific MLS tuition is assessed.

Courses

**MLS 101. Orientation to Medical Laboratory Sciences. 2 Credits.**
Introduction to the role, ethics, conduct, certification, education, employment, and fundamental knowledge and skills related to medical laboratory science. P.

**MLS 234. Human Parasitology. 2 Credits.**
Physiological aspects of human parasites, their symbiotic host parasite relationships and clinical diagnostic techniques. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. F.S,SS.

**MLS 234L. Human Parasitology Laboratory. 1 Credit.**
Laboratory methods for the identification and diagnosis of human parasites. Prerequisites: MLS, Categorical Certificate Clinical Chemistry/Urinalysis, Categorical Certificate Hematology/Hemostasis, Categorical Certificate Immunohematology or Categorical Certificate Microbiology students only. F.

**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.

**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 325L. Hematology Laboratory. 2 Credits.**
Morphologic examination of blood and bone marrow and laboratory testing used in hematological study. F.S,SS.

**MLS 336. 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.
MLS 340. 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 340L. Molecular Diagnostics Laboratory. 1 Credit.
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 380. Professional Issues in Clinical Laboratory Science. 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 clinical 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 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.
Techniques and practice in 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. 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 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,S,SS.

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.

MLS 494. Clinical Immunology. 1 Credit.
Applied theory and practice in clinical immunology and serology at the clinical affiliate. Prerequisites: MLS, Categorical Certificate Clinical Chemistry/Urinalysis, Categorical Certificate Hematology/Hemostasis, Categorical Certificate Immunohematology or Categorical Certificate Microbiology students only. S.

MLS 495. Clinical Microbiology III. 2 Credits.
Techniques and practice in clinical microbiology at the clinical affiliate. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. S.

MLS 498. Clinical Hematology III. 2 Credits.
Techniques and modern hematology practices at the clinical affiliate. Prerequisites: MLS, Clinical Chemistry/Urinalysis, Hematology/Hemostasis, Immunohematology or Microbiology program students only. S.

MBIO 202. Introductory Medical Microbiology Lecture. 3 Credits.
An introductory medical microbiology course primarily for nursing and clinical lab science students but open to allied health students with permission of the instructor. This course provides a background in all aspects of microbial agents and disease. Three hours lecture per week. Prerequisite: CHEM 116 or CHEM 121 with a grade of C or higher. F.

MBIO 202L. Introductory Medical Microbiology Laboratory. 2 Credits.
An introductory laboratory course in the isolation and identification of all types of microorganisms with an emphasis on those that cause disease. Four hours laboratory per week. Prerequisite: CHEM 116 or 121 with a grade of C or higher. Corequisite: MBIO 202. F.

MBIO 302. General Microbiology Lecture. 2 Credits.
An introduction to general microbiology with emphasis on the morphology, classification, and physiology of bacteria, fungi, parasites, and viruses. The significance of microorganisms in food processing, waste disposal, and in maintaining our environment is discussed. Two hours lecture per week. Prerequisites: BIOL 150 and CHEM 116 or CHEM 121, with a grade of C or better in both prerequisite courses or permission of instructor. S.

MBIO 302L. General Microbiology Laboratory. 2 Credits.
The growth, isolation, and identification of microorganisms from a variety of sources using procedures such as staining, microscopy, pure culturing, and biochemical tests. Four hours laboratory per week. Prerequisite or Corequisite: MBIO 302. S.

MBIO 328. Introduction to Immunology. 3 Credits.
An introduction to the fundamentals of immunology including immunochemistry, humoral and cellular response, hypersensitivity, immunodeficiency, immunogenetics, tolerance and immunodiagnosis. Prerequisite: A grade of C or higher in BIOL 150 or BIOL 151 or BMB 301. F.

MBIO 494. Directed Studies. 1-3 Credits.
A course designed to provide individual students with the opportunity for creative, scholarly and research activities in microbiology and immunology under the direction of a department faculty member. Open to all students with the consent of the instructor required. Prerequisite: Consent of instructor. Repeatable to 6 credits. F.S.SS.

Military Science (MS)

https://www.und.edu/ROTC

Murphy (Chair), Clark, Scholberg, 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:

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<tr>
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<tr>
<td>MS 301L</td>
<td>Leadership Lab III</td>
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<tr>
<td>MS 302</td>
<td>Military Science III</td>
<td>3</td>
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<tr>
<td>MS 302L</td>
<td>Leadership Lab III</td>
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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.

**Courses**

**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-ship, 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 order operation 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 FLREC (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 an 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 required, and one or two 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 MScI 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.
Music (Musc)

http://www.arts-sciences.und.edu/music

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 MS 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 401. Military Science IV. 3 Credits.  
The focus of this semester is leadership development, critical thinking, and the final preparation for commissioning as an Army Lieutenant. There is an instructional mixture of leadership, professional competence, adaptability, teamwork, lifelong learning, comprehensive fitness, and the Army as a profession. Course includes leadership laboratories and field exercises to further leader development and preparation as a future Army leader. Prerequisites: MS 101, MS 102, MS 201, MS 202, MS 301 and MS 302. Corequisites: MS 401L and MS 441. F.

MS 401L. Leadership Lab 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 401 and MS 441. F.

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 402L. Leadership Lab IV. 1 Credit.  
A culmination of all of 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.

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 forms important of physical fitness. Responsible for documentation, testing and briefing of the ROTC Battalion’s Physical Fitness Program. 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): timed pushups, sit-ups, and a two-mile run. Corequisites: MS 402 and MS 402L. S.

MS 499. Special Topics. 1-3 Credits.  
Special Topics for the Department of Military Science. Repeatable to 6 credits. Repeatable to 6 credits. F.S.

Music (Musc)
Individual Applied Music Lessons are an essential part of all music degrees. The number of applied lesson credits for each degree is listed below. Individual lessons and ensembles may be repeated for credit without limitation. A maximum of 12 hours of credit in ensembles, however, may apply for graduation.

The Bachelor of Music degree program offers majors in Performance, Music Education, and Music Therapy. The Performance major is designed for the student who wishes to pursue a career in performance and who has the ability and commitment to achieve that goal. Students desiring admission into the applied lesson sequence for performance majors (MUSC 155 Individual Lessons, MUSC 255 Individual Lessons, MUSC 355 Individual Lessons, MUSC 455 Individual Lessons) must present a formal audition before the appropriate applied faculty. Students accepted for this program must demonstrate exceptional potential for performance excellence. The Performance student is expected to present a shared recital during the third 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 the 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 Music Therapist-Board Certified (MT-BC).

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 Education (p. 194) Bachelor of Music with a Major in Music Therapy (p. ) Bachelor of Arts with a Major in Music (p. )

### 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.

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<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>6</td>
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<tr>
<td>&amp; MUSC 311</td>
<td>and Music History Survey II</td>
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<tr>
<td>MUSC 490</td>
<td>Seminar in Music</td>
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<tr>
<td>MUSC 256</td>
<td>Basic Conducting</td>
<td>2</td>
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<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>
<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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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Courses</th>
</tr>
</thead>
</table>

**Major Instrument**

- Keyboard Skills I
- Keyboard Skills II
- Keyboard Skills III
- Keyboard Skills IV
- Applied Music Pedagogy
- Junior Recital
- Senior Recital

**Performance Courses through Level IV or Keyboard Skills Sequence**

- Keyboard Skills I
- Keyboard Skills II
- Keyboard Skills III
- Keyboard Skills IV

**Vocal Majors**

#### Performance Courses

- Diction for Singers
- Opera Workshop
- Ensembles, Large and Small
- History, Literature, Theory and Composition

**Vocal Literature**

- Vocal Literature

**Electives**
### 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</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
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<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; MUSC 311</td>
<td>and Music History Survey II</td>
<td></td>
</tr>
<tr>
<td>MUSC 256</td>
<td>Basic Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
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<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
<td>3</td>
</tr>
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<td>Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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</tr>
<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
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#### Aural Skills Sequence

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<thead>
<tr>
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<th>Title</th>
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</tr>
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<tbody>
<tr>
<td>MUSC 133</td>
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<td></td>
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<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td></td>
</tr>
<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td></td>
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</table>

Piano Proficiency through Level IV or Keyboard Skills Sequence:

<table>
<thead>
<tr>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 233</td>
<td>Keyboard Skills III</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td>1</td>
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</tbody>
</table>

#### Professional Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<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>
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<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
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<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>
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<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
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</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</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
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</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>
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<tr>
<th>Course</th>
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<tbody>
<tr>
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<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>
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<tr>
<td>MUSC 236</td>
<td>Keyboard Skills IV</td>
<td></td>
</tr>
<tr>
<td>MUSC 357</td>
<td>Choral Conducting</td>
<td>4</td>
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<tr>
<td>&amp; MUSC 358</td>
<td>and Instrumental Conducting</td>
<td></td>
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<tr>
<td>MUSC 459</td>
<td>Senior Recital</td>
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#### Music Technology

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUSC 340</td>
<td>Introduction to Music Technology</td>
<td>* 2</td>
</tr>
</tbody>
</table>

* Credits apply toward T&L 390 Special Topics

### Vocal/Choral Emphasis

This coursework meets the criteria for the Choral Licensure in Music Education in North Dakota.

#### Vocal/Choral Option

<table>
<thead>
<tr>
<th>Course</th>
<th>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

#### Total Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 350</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

* Included in Instrumental Emphasis
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
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, 4
& MUSC 399 Voice 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 (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

<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</td>
<td>6</td>
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<tr>
<td>&amp; MUSC 311</td>
<td>and 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 133</td>
<td>Keyboard Skills I</td>
<td>2</td>
</tr>
<tr>
<td>&amp; MUSC 136</td>
<td>and Keyboard Skills II (or Piano Proficiency Level I &amp; II)</td>
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</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>
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</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>
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</tr>
<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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</tr>
<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
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#### Other Supportive Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>Performance (one instrument or voice)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Major Ensemble</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Electives in Theory/Comp., History/Lit., Conducting or Applied</td>
<td>7</td>
</tr>
<tr>
<td>MUSC 492</td>
<td>Senior Project</td>
<td>2</td>
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</tbody>
</table>

#### Requisites in other departments

A concentration in a single supplementary field other than Music is also required of all Bachelor of Arts in Music majors. The concentration may be satisfied in one of two ways: 1) Level IV language proficiency 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 area* taught at this university.

#### Total Credits

* Defined as courses with the same registration prefix or within a single degree major or minor area.

Students must take additional elective credits to fulfill the 125 credit hours required for degree completion.

### Composition Emphasis

Must include the following courses, which may substitute for electives:

<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>
<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 428</td>
<td>Counterpoint</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 429</td>
<td>Composition</td>
<td>2</td>
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<tr>
<td>MUSC 430</td>
<td>Composition Lessons</td>
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#### College of Arts and Sciences

### Minor in Music

Required 21 credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUSC 100</td>
<td>Introduction to the Understanding of Music</td>
<td>3</td>
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#### Core Courses

<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>6</td>
</tr>
<tr>
<td>&amp; MUSC 134</td>
<td>and Music Theory II</td>
<td></td>
</tr>
<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
<td>2</td>
</tr>
<tr>
<td>&amp; MUSC 135</td>
<td>and Aural Skills II</td>
<td></td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>or MUSC 311</td>
<td>Music History Survey II</td>
<td></td>
</tr>
</tbody>
</table>

#### Additional Courses in Music

Performance (Applied Music, Conducting, Ensembles) | 4
Electives in History/Literature/Theory/Composition (May include, but not limited to, other courses in Music Major Core, such as the following) | 6
MUSC 203 | Music and Culture | 4
MUSC 230 | Music Theory III | 2
MUSC 234 | Music Theory IV: Music Theory since 1900 | 2
MUSC 310 | Music History Survey I | 3
MUSC 311 | Music History Survey II | 2

#### Total Credits

24

### College of Education and Human Development

### Minor in Music

Required 26 credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUSC 100</td>
<td>Introduction to the Understanding of Music</td>
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#### Core Courses

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<td>&amp; MUSC 135</td>
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<td>MUSC 256</td>
<td>Basic Conducting</td>
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<td>Music History Survey I</td>
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</tr>
<tr>
<td>or MUSC 311</td>
<td>Music History Survey II</td>
<td></td>
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</tbody>
</table>

#### Additional Courses

Applied Music | 4-5
Ensembles | 2-3
MUSC 440 Methods and Materials for Elementary Music | 3

#### 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 494. 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.
Music Theory and Composition

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 od 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 compositions. Prerequisite: MUSC 230 with a grade of C or better. Corequisite: MUSC 234. F.

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, every 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 254 and MUSC 255. 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) statewide background checks with acceptable results within 1 year prior to the beginning of class, MUSC 180 the successful completion of the Sophomore 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.
Students will work on developing musical skills and techniques for the design and implementation of music therapy activities in a variety of clinical settings. Prerequisite: MUSC 281. F.S.

MUSC 382. Music Therapy Practicum II. 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. Prerequisite: Statewide (MN ND) and 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. Prerequisite: 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,SS.

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, every 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,SS.

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 152. Class Guitar for Music Majors. 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 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. Prerequisite: Permission of instructor. Repeatable. 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. Repeatable. Prerequisite: Permission of instructor; Music Education, Music Therapy, Music Majors, and Music Minors only. Repeatable. 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. Prerequisite: Permission of the instructor. Repeatable. F.S.

MUSC 253. Individual Lessons for Non-Majors. 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 254. Individual Lessons. 1 Credit.
Applied study of the stated instrument or voice at the sophomore 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 154 and permission of the instructor. Repeatable. F.S.

MUSC 255. Individual Lessons. 2 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 153 and permission of the instructor. Repeatable. F.S.

MUSC 354. Individual Lessons. 1 Credit.
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. Prerequisites: MUSC 254 and permission of the instructor; open to Music Education, Music Therapy, Music Majors, and Music Minors only. Repeatable. F.S.

MUSC 355. Individual Lessons. 4 Credits.
Applied study of the stated instrument or voice at the junior 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 255 and permission of instructor. Repeatable. F.S.

MUSC 359. 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. Prerequisites: 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 355 and permission of the instructor. 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/nlp/

Helgeson (Program Coordinator)

The Nonprofit Leadership Program is a multidisciplinary program within the College of Arts and Sciences. This program is primarily directed toward students who want to acquire skills and enhance their qualifications for service in the nonprofit sector.

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 accredited by 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: [http://www.nonprofitleadershipalliance.org/cnp/cnp.html#sthash.LqgAo34N.dpuf](http://www.nonprofitleadershipalliance.org/cnp/cnp.html#sthash.LqgAo34N.dpuf)

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**College of Arts & Sciences**

**Minor in Nonprofit Leadership**

**Core Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>A&amp;S 200</td>
<td>Introduction to the Nonprofit Sector</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;S 450</td>
<td>Capstone Experience and Development for Nonprofit</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;S 497</td>
<td>Internship</td>
<td>1-3</td>
</tr>
<tr>
<td>POLS 361</td>
<td>Nonprofit Management (Undergrad)</td>
<td>3</td>
</tr>
<tr>
<td>Electives (see course list below)</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ESPP 160</td>
<td>Sustainability &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 316</td>
<td>Entrepreneur Law &amp; Operations</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;S 294</td>
<td>Directed Studies</td>
<td>1-4</td>
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<tr>
<td>ENTR 305</td>
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<tr>
<td>ENTR 306</td>
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<tr>
<td>PSYC 301</td>
<td>Industrial and Organizational Psychology</td>
<td></td>
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<tr>
<td>COMM 401</td>
<td>Organizational Communication</td>
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**Service and Community**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 250</td>
<td>Introduction to Geopolitics</td>
<td>3</td>
</tr>
<tr>
<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
</tr>
<tr>
<td>COMM 102</td>
<td>Communication and the Human Community</td>
<td></td>
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<tr>
<td>SOC 115</td>
<td>Social Problems</td>
<td></td>
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<tr>
<td>COMM 212</td>
<td>Interpersonal Communication</td>
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<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
<td></td>
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<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td></td>
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<tr>
<td>SOC 306</td>
<td>Social Change</td>
<td></td>
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<tr>
<td>A&amp;S 294</td>
<td>Directed Studies</td>
<td>1-4</td>
</tr>
<tr>
<td>IDS 495</td>
<td>Service and Citizenship</td>
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</tbody>
</table>

**Diversity**

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 465</td>
<td>Culture, Illness and Health</td>
<td>3</td>
</tr>
<tr>
<td>WGS 200</td>
<td>Introduction to Gender Studies</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 251</td>
<td>Ethics in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 371</td>
<td>Cultural Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 379</td>
<td>Culture Area Studies</td>
<td>3</td>
</tr>
<tr>
<td>RELS 120</td>
<td>Religion in America</td>
<td></td>
</tr>
<tr>
<td>PHIL 120</td>
<td>Introduction to Ethics</td>
<td></td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to American Indian Studies</td>
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<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
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<tr>
<td>RELS 216</td>
<td>Women and Religion</td>
<td></td>
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<tr>
<td>RHS 250</td>
<td>Contemporary Issues in Rehabilitation</td>
<td></td>
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<tr>
<td>SOC 250</td>
<td>Diversity in American Society</td>
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<tr>
<td>WGS 225</td>
<td>The Study of Women</td>
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<tr>
<td>PHIL 252</td>
<td>Ethics in Business and Public Administration</td>
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<tr>
<td>COMM 402</td>
<td>Intercultural/International Communication</td>
<td></td>
</tr>
<tr>
<td>PSYC 421</td>
<td>Diversity Psychology</td>
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</tbody>
</table>

* Note: Students may “double use” courses for the Certificate and for their majors or minors.

**Certificate in Nonprofit Leadership**

**Core Requirements**

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<tr>
<td>A&amp;S 200</td>
<td>Introduction to the Nonprofit Sector</td>
<td>3</td>
</tr>
</tbody>
</table>
An introduction to management and leadership in the nonprofit sector investigating the history, philosophy, ethics, and organization of nonprofit agencies. Coursework will include introductions on volunteerism, board selection and development, fundraising, the role of a foundation, management and administration, and public relations. The course will combine a review of texts, student research, expert guest lecturers, workshops, and student presentations. F.

A&S 450. Capstone Experience and Development for Nonprofit. 3 Credits.
This course provides a “culminating experience” pulling together learning that occurred in previous courses related to nonprofit leadership program goals. Students are REQUIRED to attend the Alliance Management Institute (AMI). The Alliance Management Institute is a 3-4 day, intensive national management institute, organized for students from across the country affiliated with the Nonprofit Leadership Alliance, featuring an opportunity for students to present, attend seminars and workshops, and participate in real world case studies with nonprofit organizations. The institute is held in early January, between the fall and spring semesters. Students are required to raise funds to cover travel expenses and registration fees (app. $800-$1,000), or pay their own expenses. Fund raising efforts provide a hands-on learning experience prior to the Institute. Students will be asked to develop an integrative paper describing their institute experience. In addition students will develop a competency portfolio conveying what they have learned from the nonprofit leadership program that will be presented as the final requirement for the program before they graduate. Prerequisite: A&S 200.

A&S 497. Internship. 1-3 Credits.
This internship is a short-term work experience emphasizing hands-on learning that is not covered by regular departmental offerings, e.g., Nonprofit Leadership, Studio One. For Nonprofit Leadership interns, work experience will incorporate education and professional development in a nonprofit agency. Studio One interns produce television news, weather, sports and entertainment segments and interviews. Prospective Studio One interns must apply one semester in advance. Studio One internships are closed to pre-communication majors. Prerequisite: Permission of instructor and dean. Prerequisite or Corequisite: A&S 200. Repeatable to 3 credits. F,S,SS.

Nursing (Nurs)
http://www.nursing.und.edu

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.

Accelerated BSN (p. 204) RN to BSN Online Option (p. 205)

On-Campus Traditional BSN Program
The graduate receives the Bachelor of Science in Nursing (B.S.N.) degree and is eligible to take the NCLEX-RN, the national examination required for registered nurse licensure. UND Nursing programs are accredited by the Commission on Collegiate Nursing Education (CCNE) and are approved by the North Dakota Board of Nursing. Students must complete a formal application to the College of Nursing and Professional Disciplines and be approved for admission by the Nursing program before enrolling in the nursing curriculum. All persons who wish to apply for admission to the undergraduate nursing major are advised to become informed of all admission requirements and to follow the suggested curriculum leading to the Bachelor of Science in Nursing. All qualified students, whether currently enrolled at or planning to transfer to UND, are considered on merit. Since the College of Nursing and Professional Disciplines strives to reflect current trends in the nursing profession, there may be on-going changes in the curriculum. Information on any newly approved programs or changes in programs/major will be available on the Nursing web site.

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/.

Pre-Nursing Declaration
Students who wish to pursue an undergraduate degree in nursing must first apply to UND as a pre-nursing major in the College of Nursing and Professional Disciplines. Once the student has successfully been admitted to UND as a pre-nursing major, a nursing Office Student Services (OSS) advisor will be assigned. Students must maintain an overall GPA of 2.75 in order to continue as a pre-nursing student. If a student drops below a 2.75 GPA in any semester during the completion of courses in the pre-nursing curriculum, they will be
referred to a career counselor at the Student Success Center and the student's major will be changed to undeclared. Students may petition for re-admission to the pre-nursing major on a one time only basis if their GPA improves and reaches the required 2.75 GPA for admission to the nursing program. OSS advisors can assist students with this process.

**Nursing Program Application Process**

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 application admission.
- Admission to the University of North Dakota as a full-time freshman student.
- 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 2nd 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.
- Preference will be given to students completing all prerequisite coursework at the University of North Dakota.

- 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:
  - *English Composition 130
  - *Psychology 111
  - *Sociology 110 or 115 or Anthropology 171
  - *Chemistry 116/Lab Organic Biochemistry (or Chem122/Lab & Biology 150 & 151 & Labs)
  - *Anatomy 204 (Human Anatomy) and 204 lab
  - Math 103 College Algebra
  - Chemistry 115 & Lab or Chemistry 121 & Lab
  - Developmental Psychology 250 or Abnormal Psychology 270 (both required by August 15 for Fall admission or December 31 for Spring Admission)
  - Completion of the following courses with a grade of “C” or better prior to beginning nursing courses:
    - Microbiology 202/Lab
    - Human Physiology 301
    - Nutrition 240

*Core courses used in admission calculation.

- Core nursing prerequisite coursework may be repeated or withdrawn from a maximum of one time per course.

<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>CHEM 115</td>
<td>Introductory Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 115L</td>
<td>and Introductory Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 116</td>
<td>Introduction to Organic and Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 116L</td>
<td>and Introduction to Organic and Biochemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>5</td>
</tr>
<tr>
<td>&amp; 204L</td>
<td>and Anatomy for Paramedical Personnel Laboratory</td>
<td></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>
</tr>
<tr>
<td>or ANTH 171</td>
<td>Introduction to Cultural Anthropology</td>
<td></td>
</tr>
<tr>
<td>or SOC 115</td>
<td>Social Problems</td>
<td></td>
</tr>
<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
<td>4</td>
</tr>
<tr>
<td>or PSYC 270</td>
<td>Abnormal Psychology</td>
<td></td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

*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 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBIO 202</td>
<td>Introductory Medical Microbiology Lecture</td>
<td>5</td>
</tr>
<tr>
<td>&amp; 202L</td>
<td>and Introductory Medical Microbiology Laboratory</td>
<td></td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 240</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
III. The following curriculum:

II. A minimum overall grade point average of 2.50 prior to admission to nursing.

It is recommended that students try to complete the majority of these electives. A minimum of six (6) credits of the Essential Studies requirements which must be from a 4-year institution including:

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 the UND nursing program must meet UND and standard admission criteria. Additional pre-requisite courses will be required in accordance with the level of requested admission. Transfer nursing students must provide a letter of good standing from the 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. There are 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 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 (ES) Requirements, including 9 credits of Fine Arts and Humanities, 9 credits of Communication and approximately 3 credits of other electives. 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). It is recommended that students try to complete the majority of these prior to admission to nursing.

II. A minimum overall grade point average of 2.50.

III. The following curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>Pre-Nursing</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 115 &amp; 115L or CHEM 121 &amp; CHEM 121L</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110 or SOC 115 or ANTH 171</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Nursing</td>
<td></td>
</tr>
<tr>
<td>CHEM 116 &amp; 116L</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>5</td>
</tr>
<tr>
<td>PSYC 250 or PSYC 270</td>
<td>4</td>
</tr>
<tr>
<td>Fine Arts/Humanities</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>Pre-Nursing</td>
<td></td>
</tr>
<tr>
<td>PPT 301</td>
<td>4</td>
</tr>
<tr>
<td>MBIO 202 &amp; 202L or MBIO 302 &amp; MBIO 302L (spring only)</td>
<td>5</td>
</tr>
<tr>
<td>PSYC 270 or PSYC 250</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>Nursing</td>
<td></td>
</tr>
<tr>
<td>PPT 315</td>
<td>3</td>
</tr>
<tr>
<td>NURS 282</td>
<td>2</td>
</tr>
<tr>
<td>NURS 284</td>
<td>2</td>
</tr>
<tr>
<td>NURS 289</td>
<td>2</td>
</tr>
<tr>
<td>NURS 302</td>
<td>3</td>
</tr>
<tr>
<td>NURS 303</td>
<td>4</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td></td>
</tr>
<tr>
<td>NURS 321</td>
<td>2</td>
</tr>
<tr>
<td>NURS 322</td>
<td>3</td>
</tr>
<tr>
<td>NURS 371</td>
<td>4</td>
</tr>
<tr>
<td>NURS 372</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fine Arts/Humanities</th>
<th>3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>16</td>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>17-18</td>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
**Accelerated BSN**

This intensive program is designed for individuals who hold a bachelor’s degree in another field and are seeking an additional baccalaureate degree in nursing. The accelerated nursing curriculum is offered in four sequential academic terms (spring, summer, fall, spring). The number of credits earned are the same as those in the traditional BS in Nursing curriculum. The program is offered with the online fee structure; however, students are required to attend classes on campus. Online course tuition/fees and nursing program fees apply.

### Accelerated Admission Application Criteria (Must be completed prior to admission deadline)

- Earned baccalaureate degree in a field other than nursing from a regionally accredited institution posted on official transcript
- Submission of transcripts from all other universities or colleges to UND
- Transcripts submitted and evaluated for course equivalency
- Minimum GPA 2.75 required, GPA of 3.0 or greater preferred
- Admission to the University of North Dakota
- Submission of two references
- Completed application for admission to the CNPD Baccalaureate Nursing Accelerated program
- Completion of 5 out of 8 prerequisite courses (or equivalent) with a grade of C or better (listed below)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 116</td>
<td>Introduction to Organic and Biochemistry</td>
</tr>
<tr>
<td>ANAT 204 &amp; 204L</td>
<td>Anatomy and Physiology</td>
</tr>
<tr>
<td>MBIO 202 &amp; 202L</td>
<td>Introductory Microbiology Lecture &amp; Laboratory</td>
</tr>
<tr>
<td>or MBIO 302 &amp; 302L</td>
<td>General Microbiology Lecture &amp; Laboratory</td>
</tr>
<tr>
<td>PPT 301</td>
<td>Human Physiology</td>
</tr>
<tr>
<td>PPT 315</td>
<td>Human Pharmacology</td>
</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
</tr>
<tr>
<td>or PSYC 241</td>
<td>Introduction to Statistics</td>
</tr>
<tr>
<td>or ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>Developmental Psychology</td>
</tr>
</tbody>
</table>

### Accelerated BSN General Education/Essential Studies Requirements

Students will be required to meet all UND general education or Essential Studies requirements, as appropriate. Students who have completed their general education requirements at another North Dakota University System institution as recognized by the General Education Requirement Transfer Agreement (GERTA) or at a Minnesota State Colleges and Universities System (MnSCU) institution will be deemed to have completed their general education/essential studies requirements. It is strongly recommended that applicants work with an Office of Student Services (OSS) advisor to determine graduation and essential studies requirements as well as application status.

### Admission Acceptance Criteria

Qualified applicants will be invited to interview based on evaluation of cumulative GPA, completion of prerequisites and submitted references. Applicant interviews are conducted on-campus by the BAC2 Admission Committee. Following a successful interview, the top applicants are invited for admission with additional applicants placed on a waiting list. The number of students admitted will be determined by the Dean of the CNPD. Admission preference may be given to student with more pre-requisite courses completed. Applicants will be notified of admission decisions by mail.

Students must submit signed admission acceptance form and a non-refundable deposit towards the program fee by the date indicated on the Admission Acceptance form. Failure to return the acceptance form and deposit by designated deadline will result in loss of nursing placement. Current verifications must be completed prior to beginning nursing courses.

### Progression and Graduation Requirements

Students should note that nursing courses are sequenced to build on one another over five 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 2.50 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 373</td>
<td>Adult Nursing Care II Clinical (12 hours clinical per week)</td>
</tr>
<tr>
<td>NURS 374</td>
<td>Public Health Nursing Clinical (6 clinical hours per week)</td>
</tr>
<tr>
<td>Fine Arts &amp; Humanities</td>
<td>Credits</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Nursing</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 421</td>
<td>Child Health Nursing Theory (theory)</td>
</tr>
<tr>
<td>NURS 471</td>
<td>Child Health Nursing Clinical (3 hrs clinical per week)</td>
</tr>
<tr>
<td>NURS 472</td>
<td>Psych/Mental Health Nursing Clinical (2 hrs theory, 6 hrs clinical per week)</td>
</tr>
<tr>
<td>NURS 473</td>
<td>Multisystem Complex Adult Health (2 hrs theory, 4 hrs clinical per week)</td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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</tr>
</tbody>
</table>

**First Semester**

<table>
<thead>
<tr>
<th>Nursing</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 420</td>
<td>Interprofessional Health Care (3 hours of seminar within six weeks)</td>
</tr>
<tr>
<td>NURS 425</td>
<td>Practicum Theory (32 hours theory within two weeks)</td>
</tr>
<tr>
<td>NURS 474</td>
<td>Professional Development II (6 hours of theory for 8 weeks and experiential learning hours)</td>
</tr>
<tr>
<td>NURS 475</td>
<td>Practicum (192 hours clinical in six weeks)</td>
</tr>
<tr>
<td>NURS 476</td>
<td>Complex Childbearing Family (1.5 hrs theory, 1.5 hrs clinical/week for 8 weeks)</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

### Senior Year

Students are encouraged to consider elective nursing courses such as Cooperative Education, Independent Study and Honors; students should obtain supplemental information from their faculty adviser.
and designated background check with acceptable results, will be required prior
to admissions. Details and process will be included in admission packet.

Students must have completed all pre-requisite courses with a grade of C or
better prior to beginning the nursing program.

### Accelerated BSN Curriculum

Students complete the same nursing courses as traditional students, only in an
altered format and in a four-academic term sequence. The course sequence is:

<table>
<thead>
<tr>
<th>First Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer</strong></td>
<td></td>
</tr>
<tr>
<td>Full-term course:</td>
<td></td>
</tr>
<tr>
<td>NURS 372</td>
<td>2</td>
</tr>
<tr>
<td>1st half:</td>
<td></td>
</tr>
<tr>
<td>NURS 325</td>
<td>1</td>
</tr>
<tr>
<td>NURS 371</td>
<td>4</td>
</tr>
<tr>
<td>2nd half:</td>
<td></td>
</tr>
<tr>
<td>NURS 323</td>
<td>2</td>
</tr>
<tr>
<td>NURS 373</td>
<td>4</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>13</td>
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</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-term courses:</td>
<td></td>
</tr>
<tr>
<td>NURS 302</td>
<td>3</td>
</tr>
<tr>
<td>NURS 303</td>
<td>4</td>
</tr>
<tr>
<td>NURS 322</td>
<td>3</td>
</tr>
<tr>
<td>1st half:</td>
<td></td>
</tr>
<tr>
<td>NURS 284</td>
<td>2</td>
</tr>
<tr>
<td>NURS 289</td>
<td>2</td>
</tr>
<tr>
<td>2nd half:</td>
<td></td>
</tr>
<tr>
<td>NURS 282</td>
<td>2</td>
</tr>
<tr>
<td>NURS 321</td>
<td>2</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>18</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>Full-term course:</td>
<td></td>
</tr>
<tr>
<td>NURS 326</td>
<td>2</td>
</tr>
<tr>
<td>1st half:</td>
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<tr>
<td>NURS 421</td>
<td>2</td>
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<tr>
<td>NURS 471</td>
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<td>NURS 476</td>
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<td>2nd half:</td>
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<tr>
<td>NURS 324</td>
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<td>NURS 374</td>
<td>2</td>
</tr>
<tr>
<td>NURS 472</td>
<td>4</td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>1st half:</td>
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<tr>
<td>NURS 474</td>
<td>5</td>
</tr>
<tr>
<td>NURS 473</td>
<td>4</td>
</tr>
</tbody>
</table>

### Accelerated BSN Progression and Graduation Requirements

1. A 2.50 overall GPA is required for progression in the nursing program at the
end of each academic term.

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.

5. 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 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 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 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.

### 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

<table>
<thead>
<tr>
<th>Credits</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>&amp; ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
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<td>SOC 110</td>
<td>Introduction to Sociology</td>
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</table>
or SOC 115 or ANTH 171 or PPT 301 or MBIO 202 or PPT 315
or ANAT 204 or 204L or MBIO 202L
& 202L Human Physiology Introductory Medical Microbiology Lecture
& Introductory Medical Microbiology Laboratory
Human Pharmacology
NUTR 240 or PSYC 241 or ECON 210
Sociological Statistics Introduction to Statistics
or 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>Course</th>
<th>Credits</th>
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<tr>
<td>NURS 324</td>
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<tr>
<td>NURS 374</td>
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<tr>
<td>NURS 474</td>
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<td></td>
<td>9</td>
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<tr>
<td>NURS 282</td>
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<tr>
<td>NURS 302</td>
<td>3</td>
</tr>
<tr>
<td>NURS 350</td>
<td>3</td>
</tr>
<tr>
<td>NURS 410</td>
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</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>NURS 326</td>
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</tr>
<tr>
<td>NURS 405</td>
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<tr>
<td>NURS 415</td>
<td>3</td>
</tr>
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<td>NURS 490</td>
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<td><strong>Total Credits</strong></td>
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Part-time Curriculum

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<tr>
<th>Year</th>
<th>Course</th>
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<tr>
<td></td>
<td>NURS 324 Public Health Nursing Theory</td>
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<tr>
<td>First Year Summer</td>
<td>NURS 374 Public Health Nursing Clinical</td>
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<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td></td>
<td>NURS 282 Health Promotion</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>NURS 350 Nursing in Transition</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td></td>
<td>NURS 326 Evidence-Based Practice</td>
<td>2</td>
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<td></td>
<td>NURS 490 Transcultural Health Care Theories, Research, and Practice</td>
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<td><strong>Credits</strong></td>
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<td>Second Year Summer</td>
<td>NURS 474 Professional Development II</td>
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<td></td>
<td><strong>Credits</strong></td>
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<tr>
<td></td>
<td>NURS 302 Pathophysiology</td>
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<td></td>
<td>NURS 410 Clinical Reasoning for Safety and Quality Outcomes</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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<td>NURS 405 Informatics in Nursing</td>
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<td></td>
<td>NURS 415 Interprofessional Collaborations For Improving Health Care Systems Outcomes</td>
<td>3</td>
</tr>
<tr>
<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>

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 2.50 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 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.

129 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.
Undergraduate Nursing Courses

Unless otherwise indicated, nursing courses are open only to those admitted to the Nursing Program or with the consent of the instructor.

The methods for achievement of curriculum/course objectives may be individualized as needed.

NOTE: Some clinical courses may require early morning, evening, night, or weekend clinicals to provide the most varied and rewarding experience for the students. Some learning experiences may be at places distant from Grand Forks.

**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. Prerequisite: Nursing major. 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 282, NURS 284 and NURS 302. F.S.

**NURS 306. Palliative Care. 2 Credits.**
This two credit course will provide the student with an understanding of palliative care to include further knowledge of pain and symptom management, hope, grief and bereavement, as well as hospice care, across the settings and lifespan. Prerequisite: NURS 371 and admission to the RN-BSN track or RN-MS track. SS.

**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 303. 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 I. 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 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. 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 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 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 410. Clinical 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. Professions 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 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 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 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 489. 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 488. Nursing Practicum Theory. 2 Credits. Prerequisites: NURS 448, NURS 478, NURS 481, NURS 484, and Nursing majors only.

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://www.nursing.und.edu/nutrition/index.cfm

Goodwin, Tande, Walker and Wang

The primary mission of the Department of Nutrition and Dietetics is to prepare entry-level practitioners in nutrition and dietetics. The Department achieves this mission through its offering of two majors and a nutrition minor. The professional programs offered lead to entry-level competence and degrees in:

B.S. in Community Nutrition
B.S. in Dietetics

Academic Advising

Students are assigned an adviser in the Department of Nutrition and Dietetics 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 from the department.

Student Organizations

Student Association of Nutrition and Dietetics (SAND)

SAND is the student association for all majors 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 throughout the life cycle. Through coursework and supervised practice experiences, graduates will be prepared 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 and must attain an overall grade point average of at least 2.2.

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 (R.D.) or Registered Dietitian Nutritionist (R.D.N.). Students work in a variety of settings to assist clients to improve or maintain nutritional health. To prepare students for the type of practice most will enter, 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 60 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 conjuction with the student and academic adviser 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.

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. 86)

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:

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>ENGL 110</td>
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<td>&amp; CHEM 122</td>
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<td>ENGL 130</td>
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<td>CHEM 340</td>
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<td>and Survey of Organic Chemistry Laboratory</td>
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<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>PPT 301</td>
<td>Human Physiology</td>
<td>4</td>
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<tr>
<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>MRKT 201</td>
<td>Personal Marketing</td>
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<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
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<tr>
<td>or PSYC 241</td>
<td>Introduction to Statistics</td>
<td></td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td>COMM 212</td>
<td>Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 250</td>
<td>Developmental Psychology</td>
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</tr>
</tbody>
</table>

Total Credits 55

* 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>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<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>NUTR 240</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 245</td>
<td>Nutrition Throughout the Life Cycle</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 335</td>
<td>World Food Patterns</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 341</td>
<td>Community Nutrition I</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 342</td>
<td>Community Nutrition II</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 441</td>
<td>Advanced Nutrition</td>
<td>4</td>
</tr>
<tr>
<td>N&amp;D 494</td>
<td>Research in Nutrition and Dietetics</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 498</td>
<td>Supervised Practice in Nutrition and Dietetics</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credits 25
IV. Choice of either Option A or Option B.

Option A:

- N&D 260 Principles of Foods and Food Science 5
- N&D 340 Foodservice Systems Production 2
- N&D 440 Foodservice Systems Management 2

Total Credits 9

Option B:

- SOC 335 The Family 3
- N&D 348 Sports Nutrition 2
- or KIN 327 Fitness for Life 2
- SOC 355 Drugs and Society 3
- or PPT 315 Human Pharmacology 2
- or PPT 410 Drugs Subject to Abuse 3
- SOC 352 Aging 3
- or PSYC 355 Adulthood and Aging 3

Total Credits 11

* MGMT 300 Principles of Management may be substituted for N&D 340 Foodservice Systems Production and N&D 440 Foodservice Systems Management.

CHEM 115 Introduction to Chemistry/CHEM 115L Introduction to Organic and Biochemistry/CHEM 116 Introduction to Organic and Biochemistry Laboratory (4 cr.) and CHEM 116 Introduction to Organic and Biochemistry Laboratory (4 cr.) may replace: CHEM 121 General Chemistry I/CHEM 121L General Chemistry I Laboratory, CHEM 122 General Chemistry II/CHEM 122L General Chemistry II Laboratory, CHEM 340 Survey of Organic Chemistry/CHEM 340L Survey of Organic Chemistry Laboratory and BMB 301 Biochemistry.

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:

- ENGL 110 College Composition I 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- ANAT 204 Anatomy for Paramedical Personnel 4
- & 204L Anatomy for Paramedical Personnel Laboratory 4
- CHEM 121 General Chemistry I 4
- & 121L General Chemistry I Laboratory 4
- & CHEM 122 General Chemistry II 4
- & CHEM 122L General Chemistry II Laboratory 4
- CHEM 340 Survey of Organic Chemistry 5
- & 340L Survey of Organic Chemistry Laboratory 5
- MATH 103 College Algebra 3
- N&D 100 Introduction to Nutrition and Dietetics 1
- N&D 220 Foodservice Safety and Sanitation 1
- NUTR 240 Nutrition Throughout the Life Cycle 3
- N&D 260 Principles of Foods and Food Science 5
- N&D 335 World Food Patterns 3
- PPT 301 Human Physiology 4
- PSYC 111 Introduction to Psychology 3
- COMM 110 Fundamentals of Public Speaking 3

Electives to meet 125 credits

Total Credits 53

Professional Dietetics Requirements:

- BMB 301 Biochemistry 3
- MGMT 300 Principles of Management 3
- PSYC 241 Introduction to Statistics 4
- or SOC 326 Sociological Statistics 4
- N&D 220 Foodservice Safety and Sanitation 2
- N&D 330 Resources for Dietetic Practice 2
- N&D 340 Foodservice Systems Production 2
- N&D 341 Community Nutrition I 2
- N&D 342 Community Nutrition II 2
- 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 Nutrition and Dietetics 28

Total Credits 61

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.

For more information about the majors or minor or changes since the printing of this catalog, check the departmental website at: http://www.nursing.und.edu/nutrition.

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.S.S.

N&D 245. Nutrition Throughout 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: NUTR 240. S.

N&D 260. Principles of Foods and Food Science. 5 Credits.

Introduction to food selection and preparation principles, including consumer trends, sensory evaluation, meal and menu planning, and food sanitation. Application of scientific principles in relationship to food composition, physical properties, and chemical reactions. Prerequisite: A college level chemistry course. S.

N&D 320. Nutritional Intruits/Patient Care. 1 Credit.

Prerequisites: NUTR 240 and NURS 288. Corequisites: NURS 328 and NURS 382.

N&D 330. Resources for Dietetic Practice. 2 Credits.

This course provides opportunities for students to understand the governance of dietetics practice, including the Scope of Practice and the Code of Ethics for the Profession of Dietetics. The course also covers the process of transitioning from a student to professional status within dietetics. Prerequisite: Senior standing in Dietetics or consent of instructor. F.
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 260. F.

N&D 341. Community Nutrition I. 2 Credits.
The course assists students in: identifying the unique issues of rural communities; appreciating social causes of hunger and obesity; conducting community nutrition assessments; targeting effective nutrition educational programs to audiences across the life span. Prerequisite: N&D 260. F.

N&D 342. Community Nutrition II. 2 Credits.
The course assists students in: understanding national nutrition and health policy making; developing skills in writing grants, entrepreneurship; becoming more culturally competent. It utilizes the community assessment conducted in N&D 341 to develop a program plan. Prerequisite: N&D 341. S.

N&D 348. Sports Nutrition. 2 Credits.
Overview of the specialized nutritional needs of the athlete. Prerequisite: NUTR 240. S, even years.

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 NUTR 240, CHEM 116 or CHEM 340, and PPT 301. S.

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 498. Supervised Practice in Nutrition and Dietetics. 1-9 Credits.
Repeatable to 28 credits. 498A uses regular grading, 498B uses S/U grading. Prerequisites: Dietetics majors require consent of instructor one semester prior to enrollment. Community nutrition majors must have completed N&D 342 and have consent of instructor one semester prior to enrollment. 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. Repeatable to 28 credits. F,S,SS.

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. 548) 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. 152) listing and consult the Director of IDS in O’Kelly Hall, Room 129. For the Peace Studies requirements, see the Program Director, Dr. Enru Wang, in the Geography Department in Ireland 156 (Ireland is a wing in the east end of O’Kelly Hall).

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 all the following courses, except for the Independent Study. If one or more courses are not offered within the timeframe that students have for the 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 regional and global 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.

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.

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.

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.
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 131 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>
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<tr>
<th>Fall</th>
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<tr>
<td>GEOF 210</td>
<td>Earth Dynamics &amp; Geophysics</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I</td>
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<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I (Essential Studies)</td>
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<tr>
<td>CHEM 121 &amp; 121L</td>
<td>General Chemistry I and General Chemistry I Laboratory (ES=Q)</td>
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| Credits | 17 |

Spring

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<tbody>
<tr>
<td>PTRE 201</td>
<td>Introduction to Petroleum Engineering</td>
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<tr>
<td>MATH 166</td>
<td>Calculus II</td>
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<tr>
<td>PHYS 251 &amp; PHYS 251L</td>
<td>University Physics I and</td>
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<tr>
<td>CHEM 122</td>
<td>General Chemistry II</td>
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Sophomore Year

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<tr>
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<tr>
<td>PTRE 301</td>
<td>Reservoir Rock Properties</td>
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<tr>
<td>MATH 265</td>
<td>Calculus III</td>
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<tr>
<td>PHYS 252 &amp; PHYS 252L</td>
<td>University Physics II and</td>
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<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
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</tbody>
</table>

| Credits | 17 |
Approved Electives for Petroleum Engineering

Approved Courses for Technical Elective
PTRE 461 Natural Gas Engineering 3
PTRE 493 Selected Topics in Petroleum Engineering 1-4
CE 431 Environmental Engineering I 3
GEOG 474 Introduction to Geographic Information Systems (GIS) and GIS Laboratory 3

Approved Courses for Geology Elective
GEOL 356 Geoscience Lectures (ES=O) 3
Fall
PTRE 401 Well Logging 3
PTRE 445 Advanced Reservoir Engineering 3
GEOL 421 Seminar I (ES=O) 1
Technical Elective 3
Geology Elective 3
Social Science Elective (ES=O or U) 3
Spring
PTRE 462 Petroleum Engineering Laboratory II 2
CHE 340 Professional Integrity in Engineering 3
or ME 370 or PHIL 250
PTRE 484 Senior Design (ES= A & C) 3
GEOL 422 Seminar II (ES=O) 1
Arts & Humanities Elective (ES=O or U) 3

Total Credits 130

* DEDP students may substitute lecture series with COMM 110 Fundamentals of Public Speaking (ES=O)

ES = represents courses satisfying the Essential Studies requirements of the University.

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. Prerequisites: GEEO 203 or GEOL 101 or GEOE 210; all the prerequisites must be completed with a "C" or higher. 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, PHYS 251; all the prerequisites must be completed with a "C" or higher. 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 351. Petroleum Engineering Laboratory I. 2 Credits.
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. Prerequisite: PTRE 301; all the prerequisites must be completed with a "C" or higher. F.

PTRE 405. Petroleum Eng., Economy and Law. 3 Credits.
Presenting the principals of asset management with emphasize 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 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 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. Prerequisites: PTRE 411 and PTRE 431; all the prerequisites must be completed with a "C" or higher. 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 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. S.

Approved Electives for Petroleum Engineering
PTRE 445. Advanced Reservoir Engineering. 3 Credits.
Well test analysis using type curve techniques, Material balance for oil and gas reservoirs, Water influx calculations, Immobile 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 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 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: GEOE 301, ME 306, ME 341, and PTRE 311. S.

PTRE 462. Petroleum Engineering Laboratory II. 2 Credits.
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 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 411 and PTRE 431; all the prerequisites must be completed with a "C" or higher. 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 discretization concepts, as well as history matching and reservoir performance forecast. Prerequisites: PTRE 445 and MATH 266; all the prerequisites must be completed with a C or higher. F.

PTRE 484. 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 485 and PTRE 405 or ENGR 460. S.

PTRE 485. 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. Prerequisite: PTRE 451 and PTRE 445. 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 320. Pharmacology in Sport. 2 Credits.
This course is designed to teach students the theories and principles of Pharmacology as it relates to Athletic Training.

PPT 410. Drugs Subject to Abuse. 2 Credits.
Biochemical, pharmacological, behavioral and therapeutic aspects of substance abuse. Prerequisite: Advanced undergraduate standing. S.

PPT 492. Research in Pharmacology, Physiology and Therapeutics. 1-4 Credits.
Laboratory research under faculty supervision. Prerequisite: Consent of instructor. Repeatable to 6 credits. F,S,SS.

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,SS.

Philosophy and Religion (Phil and Rels)

http://www.arts-sciences.und.edu/philosophy-religion

Beltz, Lawrence, Marovich, 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 (p. )

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:

| PHIL 101 | Introduction to Philosophy | 3 |
| PHIL 110 | Introduction to Logic | 3 |
| Select one of the following (Applied Philosophy): | 3 |
| PHIL 120 | Introduction to Ethics | |
| PHIL 130 | Introduction to Political Philosophy | |
| PHIL 221 | Symbolic Logic | |
| PHIL 250 | Ethics in Engineering and Science | |
| PHIL 251 | Ethics in Health Care | |
| PHIL 252 | Ethics in Business and Public Administration | |
| PHIL 253 | Environmental Ethics | |
| Select two of the following (History of Philosophy): | 6 |
| PHIL 300 | Ancient Philosophy | |
| PHIL 301 | Medieval Philosophy | |
| PHIL 302 | Renaissance and Enlightenment | |
| PHIL 303 | Kant and the Nineteenth Century | |
| Select two of the following (Major Topics in Philosophy): | 6 |
| PHIL 312 | American Philosophy | |
| PHIL 321 | Analytic Philosophy | |
| PHIL 331 | Continental Philosophy | |
| PHIL 342 | Ethical Theory | |
| PHIL 355 | Social and Political Philosophy | |
| PHIL 360 | Feminist Philosophy | |
| PHIL 383 | Asian Philosophy | |
| Select one of the following (Philosophical Topics): | 3 |
| PHIL 400 | Philosophy of Language | |
| PHIL 410 | Metaphysics: What Is Real? | |
| PHIL 415 | Philosophy of Mind | |
| PHIL 420 | Epistemology: What is Knowledge? | |
| PHIL 425 | Metaethics - Is Ethics Possible? | |
| PHIL 441 | Existentialism | |
| PHIL 442 | Phenomenology | |
| PHIL 443 | Aesthetics | |
| PHIL 450 | Philosophy, Economics, and Politics | |
| PHIL 451 | Citizenship and Political Participation | |
| PHIL 460 | Philosophy of Law | |
| PHIL 480 | Public Philosophy (capstone - required) | 3 |
| Electives | 9 |

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:

| PHIL 101 | Introduction to Philosophy | 3 |
| PHIL 110 | Introduction to Logic | 3 |
| PHIL 120 | Introduction to Ethics | 3 |
| PHIL 221 | Symbolic Logic | 3 |
| PHIL 460 | Philosophy of Law | 3 |
| PHIL 480 | Public Philosophy | 3 |
| Ethics Courses (3 credits from the following): | 3 |
| PHIL 251 | Ethics in Health Care | |
| PHIL 252 | Ethics in Business and Public Administration | |
| PHIL 253 | Environmental Ethics | |
| PHIL 342 | Ethical Theory | |
| PHIL 425 | Metaethics - Is Ethics Possible? | |
| Social-Political Philosophy Courses (9 credits from the following): | 9 |
| PHIL 130 | Introduction to Political Philosophy | |
| PHIL 312 | American Philosophy | |
| PHIL 355 | Social and Political Philosophy | |
| PHIL 360 | Feminist Philosophy | |
| PHIL 450 | Philosophy, Economics, and Politics | |
| PHIL 451 | Citizenship and Political Participation | |
| Electives (6 credits): | |
| Electives can be earned from classes in Philosophy (PHIL) or Religion (RELS) | 6 |

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):

| RELS 100 | Introduction to Religious Inquiry | 3 |
| RELS 480 | Religion Capstone | 3 |
| Select one of the following (Western Traditions): | 3 |

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Required 21 credits including:

- **Philosophy Concentration**
- Minor in Philosophy and Religion:
  - **Philosophy Electives**
  - **Religion Electives**

Select one of the following (Asian Traditions):
- RELS 100 Introduction to Religious Inquiry
- RELS 102 Religions of Asia
- RELS 315 Daoism and Confucianism
- RELS 320 Hinduism
- RELS 380 Buddhism
- RELS 410 Asian Religions in the United States

Select one of the following (Biblical Studies):
- RELS 221 Jewish Scripture/Old Testament
- RELS 231 Christian Scripture/New Testament
- RELS 300 Jesus in Gospel and History
- RELS 301 Life and Religion of Paul
- RELS 321 Prophets and Prophecy

Select two of the following (Contemporary Problems and Ideas):
- RELS 120 Religion in America
- RELS 216 Women and Religion
- RELS 245 Death and Dying
- RELS 250 East and West in Religion
- RELS 305 Mysticism
- RELS 309 Atheism, Theism and Secularism
- RELS 342 Religious Ethics
- RELS 423 Psychology of Religion
- RELS 431 Religious Violence and the Apocalyptic Mind
- RELS 466 Sex, Gender and Religion

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:
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);\nlogistic 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: professional responsibility of engineers 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
traditional philosophy, the nature of the good, 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 the connections between contemporary political
theories of political society. Offered Fall every 3 years (2008).

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, Ricoeur, 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, a few examples of possible topics. Students in the
course may examine the connections between contemporary political
theories of political society. Offered Fall every 3 years.

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
studied include: Charlotte Perkins Gilman, Mary Wollstonecraft, Simone de
Beauvoir, Susan Bordo, Catharine MacKinnon, Luce Irigaray, 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 431. Philosophy of Science. 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, Ricoeur, and Zizek. Offered Fall 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, Edmund 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, forgiveness, 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 common 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 twenty-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 examination of 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 an application process. Repeatable up to 12 credits. Prerequisite: Permission of instructor. Repeatable to 12 credits. On demand.

Physical Therapy (PT)

http://www.med.und.edu/physical-therapy

Danks, Decker, Flom-Meland, Jeno, Johnson, LaBrecque, Mabey, P. Mohr, T. Mohr, Relling (Chair), Romanick, Schindler and Wessman

See Physical Therapy (p. 556) in the Graduate Section.

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 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 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 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.

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 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 interest. 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 510. Integrated Clinical Experience. 1 Credit.
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 519. Electrotherapy and Electrodiagnosis. 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. S.

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. Manual Therapy 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. F.

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. S.

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. F.

PT 540. Cardiopulmonary Physical Therapy. 2 Credits.
This course is designed to expand the theoretical understanding and clinical application of cardiopulmonary physical therapy examination, evaluation, 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 interventions. Emphasis is also given to the communication of findings. Laboratory. F.

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 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.
Supervised experience in University teaching in Physical Therapy. Projects in curriculum development, formulation of teaching/learning objectives, teaching materials, evaluation tools, and experience in competency-based learning environment. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 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. S.

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 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.

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:
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</th>
<th>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>
</tbody>
</table>

Total Credits 11

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</th>
<th>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>
</tbody>
</table>

Total Credits 9

Students in this track should select approved research projects in materials science as a means of satisfying the PHYS 415 Undergrad Research Experience requirement.

Five-year B.S.-M.S. Degree in Physics

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</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>
</tbody>
</table>

Total Credits 70

To provide proper advisement, the Department of Physics and Astrophysics requires its majors to meet with their physics adviser 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</th>
<th>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>
</tbody>
</table>

Total Credits 14

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</th>
<th>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>
</tbody>
</table>

Total Credits 13

The program course requirements include the following courses:
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:

- PHYS 110: Introductory Astronomy, 3 Credits
- PHYS 110L: Introductory Astronomy Lab, 1 Credit
- PHYS 211: College Physics I, 4 Credits
- PHYS 211L: College Physics I Laboratory, 1 Credit
- PHYS 212: College Physics II, 4 Credits
- PHYS 212L: College Physics II Laboratory, 1 Credit
- PHYS 213: College Physics III
- PHYS 213L: College Physics III Laboratory
- PHYS 251: University Physics I
- PHYS 251L: University Physics I Laboratory
- PHYS 252: University Physics II
- PHYS 252L: University Physics II Laboratory
- PHYS 253: University Physics III
- PHYS 253L: University Physics III Laboratory
- PHYS 460: Introduction to Astrophysics, 3 Credits
- PHYS 461: Introduction to Astrophysics II, 3 Credits
- Select one of the following:
  - PHYS 415: Undergrad Research Experience, 3 Credits
  - PHYS 434: Nuclear Physics
  - SPST 425: Observational Astronomy

Total Credits 33

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 251. University Physics I. 4 Credits.
The university physics sequence is for students majoring in science and engineering. Topics normally covered in PHYS 251 include Newtonian mechanics and gravitation, work and energy, rotational dynamics, vibrations and waves, mechanics of solids and fluids, basic kinetic theory, equations of state and the first and second laws of thermodynamics. The laboratory is a component of this course. Prerequisite: MATH 165. F.S.

PHYS 252. University Physics II. 4 Credits.
Topics normally covered include electricity, magnetism, electromagnetic waves, light and geometrical optics. The laboratory is a component of this course. Prerequisites: MATH 166 and PHYS 251. F.S.

PHYS 253. University Physics III. 4 Credits.
Modern physics, a survey covering physics of the 20th and 21st centuries. Topics normally covered include theory of relativity, discovery of quantum phenomena, basic quantum mechanics, overview of atomic, nuclear and solid state physics, statistical physics, quantum fluids and superconductivity, fundamental forces and the physics of elementary particles. This course is a prerequisite for most courses in advanced physics. The laboratory is a component of this course. Prerequisites: MATH 265 and PHYS 252. S.

PHYS 294. Selected Topics. 1-4 Credits.
Prerequisite: 8 hours of college physics or consent of instructor. Repeatable to 4 credits. On demand.

PHYS 317. Mechanics I. 3 Credits.
Motion of a single particle, central forces and simple oscillatory systems. Prerequisites: PHYS 251 and MATH 266, or approval of department. F.

PHYS 318. Mechanics II. 3 Credits.
Rigid body motion, Lagrangian and Hamiltonian dynamics, relativity, continuum mechanics. Prerequisite: PHYS 317 or approval of instructor. S, even years.

PHYS 320. Introduction to Materials Science. 3 Credits.
An introduction to solid state physics with emphasis on applications. Prerequisite: PHYS 253 or approval of department. F, even years.

PHYS 324. Thermal Physics. 3 Credits.
Thermodynamics with an introduction to statistical physics. Prerequisite: PHYS 253 or approval of instructor. S, even years.

PHYS 325. Optics. 3 Credits.
Geometrical and physical optics with an emphasis on physical optics. Prerequisite: PHYS 253 or approval of department. S, odd years.

PHYS 325L. Optics Laboratory. 1 Credit.
Laboratory to accompany PHYS 325. Corequisite: PHYS 325. S, odd years.

PHYS 327. Electricity and Magnetism I. 3 Credits.
A quantitative treatment of electromagnetic theory with an introduction to Maxwell's equations. Prerequisite: PHYS 253 or approval of instructor. S, even years.

PHYS 328. Electricity and Magnetism II. 3 Credits.

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 415. Undergrad Research Experience. 3 Credits.
The students will engage in research activities of a UND physics faculty member or may take part in a physics department approved external research program such as an NSF-funded REU program. Prerequisite: PHYS 253 or advisor's consent.

PHYS 420. Advanced Topics in Materials Science. 3 Credits.
The application of physics to design, synthesis and characterization of materials of current interest. Prerequisite: PHYS 320. S, odd years.

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, odd 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, even 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, even 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 460. Introduction to Astrophysics. 3 Credits.
Nature of stars. Topics include celestial mechanics, relativity, optics, stellar birth, stellar interiors and evolution, nucleosynthesis, stellar death, compact objects, black holes, neutron stars, white dwarfs, binaries and variable stars. Some topics include the use of computer tools to solve problems. Prerequisite: PHYS 253 or approval of instructor. F, odd 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. F, odd years.

PHYS 489. Senior Honors Thesis. 1-15 Credits.
Prerequisite: Approval of the department. Repeatable to 3 credits. F.S.

Political Science (Pols)

http://business.und.edu/departments/political-science-public-administration/index.cfm

Hand, Harsell, Hultquist, Jendryszik, Jensen, Kassow, Light, Sum (Chair), Urlacher and Wood

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 Administration. 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. Examples of narrower pathways include, but are not limited to, Human Rights, Political Behavior, the Politics of Gender or Race, Public Law, 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).

II. BA in Political Science Program Requirements:

a. At least a 2.50 GPA overall
b. At least a 2.50 GPA for courses required within the major

III. Core Curriculum:

Introductory-level coursework

<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>POLS 116</td>
<td>State and Local Government</td>
<td>3</td>
</tr>
</tbody>
</table>

Intermediate-level coursework

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>POLS 250</td>
<td>Introduction to Public Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

Advanced-level coursework

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 300</td>
<td>Introduction Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 310</td>
<td>Introduction to Political Thought</td>
<td>3</td>
</tr>
<tr>
<td>POLS 405</td>
<td>Political Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

A Capstone experience

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 495</td>
<td>Senior Colloquium in Political Science and Public Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

Political Science students also will take 12 hours of electives, normally at the 300-level or above. Up to three (3) credits at the 200-level may be counted towards this elective requirement without prior departmental approval. Majors may take up to six (6) hours of these electives, at the 300-level or above from relevant courses outside the department with prior departmental approval.

Total Credits 36

Select two of the following:

- Students may substitute POLS 308 Intergovernmental Relations with departmental approval.

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 326 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

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
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<td>POLS 115</td>
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<td>3</td>
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</tbody>
</table>

Intermediate-level coursework

Select two of the following:

<table>
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<tbody>
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<td>POLS 225</td>
<td>Comparative Politics</td>
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</tr>
<tr>
<td>POLS 250</td>
<td>Introduction to Public Administration</td>
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</table>

Advanced-level coursework

Select two of the following:

<table>
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</thead>
<tbody>
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<td>3</td>
</tr>
<tr>
<td>POLS 310</td>
<td>Introduction to Political Thought</td>
<td>3</td>
</tr>
<tr>
<td>POLS 305</td>
<td>American Constitution-Governmental Powers</td>
<td>3</td>
</tr>
<tr>
<td>POLS 306</td>
<td>American Constitution-Civil Liberties</td>
<td>3</td>
</tr>
<tr>
<td>POLS 405</td>
<td>Political Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives (intermediate level or above) 6

Total Credits 21

POL 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.

POL 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.

POL 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.

POL 225. Comparative Politics. 3 Credits. An introduction to comparative politics with emphasis on the democratic systems of Europe. F.

POL 250. Introduction to Public Administration. 3 Credits. Introduction to the development of public administration in the United States and 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.

POL 300. Introduction Research Methods. 3 Credits. General consideration of research methods and data analysis in political science and the social sciences. F.

POL 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.

POL 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. Analyzes 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. Augustine, 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.
POLS 327. Transitions to Democracy. 3 Credits.
Based on the liberal democratic theory, the course will investigate the different processes and components that are associated with successful democratization. The course will evaluate multiple case studies, including those found in Southern Europe, Latin America and Post-communist Europe. The course will conclude with an assessment of cases beginning to democratize presently. S, odd years.

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 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.

POLS 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.

POLS 393. Problems in Political Science. 1-3 Credits.
Students study special topics under the direction and supervision of a member of the staff. Repeatable when topics vary. Repeatable. F, S.

POLS 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.

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 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.

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 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.

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 489. Senior Honors Thesis. 1-15 Credits.

POLS 491. Readings in Political Science. 1-3 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.

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.

Psychology (Psyc)
http://www.arts-sciences.und.edu/psychology
Bradley, Clinton, Derenne, De Young, DiLorenzo, Ferraro, Holm (Chair), Kehn, Kelly, King, Legerski, Looby, McDonald, Miller, Peters, Petros, Plumm, Poltavski, Ruthig, Terrance, Terrell, Weatherly, Williams, 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 below, that all majors must complete.

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>

Students must complete at least TWO 400-level courses from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 421</td>
<td>Diversity Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 433</td>
<td>Psychology of Learning</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 436</td>
<td>Perception</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 437</td>
<td>Physiology of Behavior and Psychophysiological Measurement</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 439</td>
<td>Cognitive Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 441</td>
<td>Case-Based Applied Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 460</td>
<td>Advanced Social Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 470</td>
<td>Intro Clinical Psychology</td>
<td>4</td>
</tr>
</tbody>
</table>

Students must also complete at least 2 credits of applied experience from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 395</td>
<td>Practical Experiences in Psychology</td>
<td>1-4</td>
</tr>
<tr>
<td>PSYC 475</td>
<td>Psychological Helping Skills</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 493</td>
<td>Instructional Experiences in Psychology</td>
<td>2</td>
</tr>
</tbody>
</table>

* PSYC 111 Introduction to Psychology is prerequisite to all other psychology classes.

Required in other departments:

Level II proficiency in a foreign language, or equivalent proficiency in American Sign Language

Select two of the following (with lab):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Concepts of Biology</td>
<td>1-4</td>
</tr>
<tr>
<td>BIOL 111L</td>
<td>Concepts of Biology Laboratory</td>
<td>1-4</td>
</tr>
<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>3</td>
</tr>
</tbody>
</table>

226 Psychology (Psyc)
**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 Code</th>
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</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 304</td>
<td>Advanced Research Methods</td>
<td></td>
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</tbody>
</table>

Students must complete one of the following (laboratory-based course):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 210</td>
<td>Human Sexuality</td>
<td>3</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>
</tbody>
</table>

Students receiving teaching certification in secondary education must also include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
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</table>

**Minor in Psychology**

Required 20 credits, including:

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<tbody>
<tr>
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<td>Developmental Psychology</td>
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</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

**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. F,S,SS.

**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 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 111, junior or senior status, and a minimum overall GPA of 3.0. Prerequisite or Corequisite: PSYC 320. Repeatable to 8 credits. S/U grading. F,S,SS.

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. F,S,SS.

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/departments/political-science-public-administration/index.cfm

Hand, Harsell, Hultquist, Jensen, Jendrysik, Kassow, Light, 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 B.S.P.A. is offered through the College of Business and Public Administration. The Public Administration program has a core of liberal arts courses combined with courses from the administrative sciences. The communication and analytical skills emphasized prepare students for employment in the public, not-for-profit, and private sectors; graduate studies; law school; and teaching.

The Department also offers a graduate program through the School of Graduate Studies leading to the Masters of Public Administration. Some students may qualify for a 5-year undergraduate Public Administration/Master of Public Administration (MPA) program. See the Graduate (p. 345) 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. The Following Curriculum:

Pre-Public Administration Core

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
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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>Elements of Accounting II</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>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>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; POLS 116</td>
<td>and State and Local Government</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>POLS 250</td>
<td>Introduction to Public Administration</td>
<td>3</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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Total Credits 34

IV. General Public Administration

Required:

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<td>ECON 324</td>
<td>Public Finance</td>
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<tr>
<td>POLS 300</td>
<td>Introduction Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 328</td>
<td>Legislative Processes</td>
<td>3</td>
</tr>
<tr>
<td>or POLS 329</td>
<td>Presidential Institutions and Management</td>
<td>3</td>
</tr>
<tr>
<td>POLS 404</td>
<td>Urban Politics and Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 432</td>
<td>Public Policy Making Process</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>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>or SOC 431</td>
<td>Organizations and Behavior</td>
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</tr>
<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
<td>3</td>
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</table>

Total Credits 30

Public Administration students are required to complete six hours of elective credit. Elective coursework can come from additional PSPA courses or from other disciplines. Consult with your Public Administration advisor for approval of elective credit.

Minor in Public Administration

Required 21 credits, including:

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
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<td>POLS 250</td>
<td>Introduction to Public Administration</td>
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</tr>
<tr>
<td>POLS 300</td>
<td>Introduction Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 404</td>
<td>Urban Politics and Administration</td>
<td>3</td>
</tr>
<tr>
<td>POLS 432</td>
<td>Public Policy Making Process</td>
<td>3</td>
</tr>
<tr>
<td>POLS 437</td>
<td>Administrative Processes</td>
<td>3</td>
</tr>
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</table>

Select two of the following:

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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 324</td>
<td>Public Finance</td>
<td>3</td>
</tr>
<tr>
<td>POLS 328</td>
<td>Legislative Processes</td>
<td>3</td>
</tr>
<tr>
<td>POLS 329</td>
<td>Presidential Institutions and Management</td>
<td>3</td>
</tr>
<tr>
<td>POLS 433</td>
<td>Public Administration Behavior and Theory</td>
<td>3</td>
</tr>
<tr>
<td>POLS 480</td>
<td>Administrative Internship</td>
<td>3</td>
</tr>
<tr>
<td>SOC 431</td>
<td>Organizations and Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

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 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.

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/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 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://www.und.edu/

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>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 260</td>
<td>Group Leadership</td>
<td>3</td>
</tr>
<tr>
<td>RTS 272</td>
<td>Recreation and the Natural Environment</td>
<td>3</td>
</tr>
<tr>
<td>RTS 322</td>
<td>Recreation Program and Event Planning</td>
<td>3</td>
</tr>
<tr>
<td>RTS 323</td>
<td>Recreation Program and Event Implementation</td>
<td>3</td>
</tr>
<tr>
<td>RTS 398</td>
<td>Field Experience in Recreation and Leisure Services</td>
<td>2 (1+1)</td>
</tr>
<tr>
<td>RTS 421</td>
<td>Research and Evaluation Methods</td>
<td>3</td>
</tr>
<tr>
<td>RTS 442</td>
<td>Recreation Administration</td>
<td>3</td>
</tr>
<tr>
<td>Basic Statistics Course</td>
<td></td>
<td>3</td>
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<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
<td></td>
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<tr>
<td>PSYC 241</td>
<td>Introduction to Psychology</td>
<td></td>
</tr>
<tr>
<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>MGMT 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
</tr>
<tr>
<td>RTS 497</td>
<td>Internship in Recreation Tourism Studies</td>
<td>4-12</td>
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</tbody>
</table>

Total Credits 36-44

Minor in Recreation and Tourism Studies

Required for the Recreation and Tourism Studies minor:

20 credits, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>RTS 201</td>
<td>Recreation and Society</td>
<td>3</td>
</tr>
<tr>
<td>RTS Courses (Approved by an RTS advisor)</td>
<td></td>
<td>17</td>
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</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

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.

Rehabilitation and Human Services (RHS)
http://education.und.edu/counseling-psychology-and-community-services/
  rehab-human-services.cfm

Perry (Program Coordinator)

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
cordinator.

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 (CPCS) 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. 407) in the Graduate section of the
catalog.

Please note: The RTS 201 course, which was used as an elective for some of
the RHS Concentrations, will no longer be available after Summer 2016. However,
RTS 260 has been changed to RHS 260 and will still be offered.

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).

II. College of Education and Human Development requirements (see EHD
listing).

III. Core Curriculum (36 credits):

<table>
<thead>
<tr>
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<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
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<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>
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<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>
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<td>RHS 493</td>
<td>Senior Capstone Seminar</td>
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<tr>
<td>RHS 497</td>
<td>Internship in Rehabilitation</td>
<td>9</td>
</tr>
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Any Research Methods Class, e.g.:

- SOC 323 Sociological Research Methods
- PSYC 303 Research Methods in Psychology

Any Statistics Course, e.g.:

- SOC 326 Sociological Statistics
- PSYC 241 Introduction to Statistics

Total Credits 36

IV. Extra Departmental Requirements (13 credits):

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<tr>
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<tr>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
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<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
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<tr>
<td>PSYC 360</td>
<td>Introduction to Personality</td>
<td>3</td>
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<tr>
<td>SOC 361</td>
<td>Social Psychology</td>
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Total Credits 13

V. At Least One Concentration from the Following (10 credits):

Substance Abuse

Select four of the following:

- SWK 315 Substance Use and Abuse
- T&L 350 Development and Education of the Adolescent
- RTS 201 Recreation and Society
- RTS 260
- PPT 315 Human Pharmacology
- PPT 410 Drugs Subject to Abuse
- PSYC 270 Abnormal Psychology
- SOC 355 Drugs and Society

Other courses as approved by Program Coordinator

Mental Health

Select four of the following:

- RHS 375 Community Living Topics
- RTS 201 Recreation and Society
- RTS 260
- PSYC 270 Abnormal Psychology
- PSYC 360 Introduction to Personality
- T&L 319 Inclusive Strategies

Other courses as approved by Program Coordinator

Gerontology

Select four of the following:

- RHS 375 Community Living Topics
- RTS 201 Recreation and Society
- RTS 260
- PSYC 270 Abnormal Psychology
- PSYC 360 Introduction to Personality
- T&L 319 Inclusive Strategies

Other courses as approved by Program Coordinator
SWK 313  Orientation to Gerontology
RTS 201  Recreation and Society
RTS 260  
PSYC 355  Adulthood and Aging
SOC 352  Aging
Other courses as approved by Program Coordinator

Developmental Disabilities
Select four of the following: 10
RTS 201  Recreation and Society
RTS 260  
T&L 315  Education of Exceptional Students
T&L 319  Inclusive Strategies
CSD 101  American Sign Language I
Other courses as approved by Program Coordinator

Other Specialty Areas
Select 10 credits from the following: 10
Criminal Justice
Deaf Studies
Prosthetics and Orthotics
Traumatic Brain Injuries
Visual Impairments
Courses must be approved by the RHS Advisor

Minor in Rehabilitation and Human Services
(20 credits)

I. Required Courses (15 credits):
COUN 250  Dialogue on U.S. Diversity 3
RHS 250  Contemporary Issues in Rehabilitation 3
RHS 350  Overview of Disabilities (Select for the respective majors) 3
or OT 432  Medical Science II
or PT 409  Clinical Pathology I
or NURS 420  Interprofessional Health Care
RHS 450  Vocational Assessment and Job Acquisition 3
RHS 455  Rehabilitation Process 3

Total Credits 15

II. Elective Courses (5 credits from the following):
ANAT 204  Anatomy for Paramedical Personnel 3
CSD 343  Language Development 3
NURS 490  Transcultural Health Care Theories, Research, and Practice 3
PSYC 270  Abnormal Psychology 3
RHS 200  Helping Skills in Community Services 3
RHS 375  Community Living Topics 3
RTS 260  

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. S.

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. 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. 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 BSEd program in Social Studies (see Department of Teaching and Learning (p. 238) 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.

* For Geography courses carrying Social Science credit, see University ES listing.

Social Work (SWk)

http://www.nursing.und.edu/departments/social-work/

Barkdoll (Chair), Becker, Chu, Flanagan, Heitkamp, Hsieh, Jayasundara, Johnson, Kilko, Kramer, Muhs, Nededgaard, Quinn, Quest, Reeves, Sage, Sage, Schneweis and Weber

The Department of Social Work offers a Bachelor of Science in Social Work (BSSW) and a Master of Social Work (MSW) degree. The mission of the Department of Social Work is to advance knowledge and learning and to prepare competent, responsive and ethical social workers who empower vulnerable populations, promote social justice, and are committed to serving diverse populations.

The mission of the University of North Dakota 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. The program was first accredited by the Council on Social Work Education in 1974. The goals of the program are to:

1. Build upon students’ liberal arts foundation to provide the knowledge, values and skills necessary for competent social work generalist practice.
2. Prepare students for culturally responsive practice in rural communities.
3. Prepare students for service and leadership within the community and the social work profession.
4. Prepare students for continued professional development opportunities.

Social work courses were first offered at the University of North Dakota in 1905; the social work program was formally established in 1939. The Commission on Accreditation (2012) states, “The purpose of the social work profession is to promote human and community wellbeing. Guided by a person and environment construct, a global perspective, respect for human diversity, and knowledge based on scientific inquiry, social work’s purpose is actualized through its quest for social and economic justice, the prevention of conditions that limit human rights, the elimination of poverty, and the enhancement of the quality of life for all persons.

Students interested in declaring social work as a major notify the BSSW Program Director who will assign an advisor. Students will meet with their assigned advisor, who will work with the student throughout the remainder of their career at UND.

Accreditation

The Bachelor of Science in Social Work is accredited by the Council on Social Work Education.

Admission Requirements and Process

Criteria for Admission:

2. Overall GPA of 2.75
3. Grade of B 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, 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.

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 (40 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. 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. 234)

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>
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<tr>
<td>SWK 484</td>
<td>Field Education Seminar II</td>
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<tr>
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<td>Social Work Elective</td>
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Liberal Arts Requirements for Social Work majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</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></td>
<td>Advanced Social Sciences Courses (200-level or above)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Global Diversity or United States Diversity courses (cannot double count for essential studies)</td>
<td>6</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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 481</td>
<td>Field Education I</td>
<td>5</td>
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<tr>
<td>SWK 482</td>
<td>Field Education Seminar I</td>
<td>1</td>
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<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>
</tbody>
</table>

Total Credits: 12

Full-Time Second Degree Schedule for BSSW (40 hours)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>SWK 255</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>SWK 257</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 317</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 357</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 424</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Work Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>SWK 255</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>SWK 257</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 317</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 424</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Work Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>SWK 357</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 434</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 442</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SWK 454</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Work Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

* 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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 311</td>
<td>Child Welfare</td>
<td>3</td>
</tr>
<tr>
<td>SWK 312</td>
<td>Social Work and the Legal Process</td>
<td>2</td>
</tr>
<tr>
<td>SWK 313</td>
<td>Orientation to Gerontology</td>
<td>3</td>
</tr>
<tr>
<td>SWK 315</td>
<td>Substance Use and Abuse</td>
<td>2</td>
</tr>
<tr>
<td>SWK 316</td>
<td>Interprofessional Health Care</td>
<td>1</td>
</tr>
<tr>
<td>SWK 318</td>
<td>Mental Health</td>
<td>2</td>
</tr>
<tr>
<td>SWK 397</td>
<td>Cooperative Education</td>
<td>1-4</td>
</tr>
<tr>
<td>SWK 489</td>
<td>Senior Honors Thesis (repeatable to a maximum 6 credits)</td>
<td>1-3</td>
</tr>
<tr>
<td>SWK 493A</td>
<td>Special Topics (repeatable to a maximum 9 credits)</td>
<td>1-3</td>
</tr>
</tbody>
</table>

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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 313</td>
<td>Orientation to Gerontology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 284</td>
<td>Functional Changes in Aging</td>
<td>2</td>
</tr>
<tr>
<td>PSYC 355</td>
<td>Adulthood and Aging</td>
<td>3</td>
</tr>
<tr>
<td>SOC 352</td>
<td>Aging</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 120</td>
<td>Introduction to Ethics</td>
<td>3</td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to American Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 240</td>
<td>Psychology of Aging</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>Introduction to Nutritional Care</td>
<td>3</td>
</tr>
</tbody>
</table>
PSYC 331  Behavior Modification and Therapy
PSYC 421  Diversity Psychology
RELS 245  Death and Dying
RTS 260
SOC 354  Medical Sociology
SWK 257  Human Behavior and the Social Environment I
RHS 350  Overview of Disabilities

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.

### Chemical Dependency Minor

Required (20 credits) including:

- PPT 410  Drugs Subject to Abuse
- SOC 355  Drugs and Society
- SWK 315  Substance Use and Abuse

Select five of the following:

- COUN 250  Dialogue on U.S. Diversity
- COUN 529  Dynamics of Addiction
- IS 311  Health and American Indian Cultures
- PPT 499  Readings in Pharmacology, Physiology and Therapeutics
- PSYC 360  Introduction to Personality
- PSYC 270  Abnormal Psychology
- SOC 115  Social Problems
- SOC 335  The Family
- T&L 350  Development and Education of the Adolescent

Total Credits 20

* Course required for licensing in addiction counseling in North Dakota.
** Student must be senior status or graduate level to enroll in this course.

### 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 256. Social Welfare. 2 Credits.

#### 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. Biopsychosocio-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, physical 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. S.

#### 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 practical world of the internship setting. Also can be taken with SWK 483 for a one-semester block placement in an approved human service organization. Prerequisite: Admission to field program. Corequisite: SWK 482. S/U grading. 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.
Individually 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

Badahdah, 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:

SOC 301 Basic Sociological Theory 3
SOC 323 Sociological Research Methods 3
SOC 326 Sociological Statistics 3
SOC 475 Sociology Capstone 3
Additional credits numbered 400 and above 6
Electives in Sociology 15

Total Credits 33

* excluding SOC 475 Sociology Capstone, SOC 492 Practicum in Sociology and SOC 494 Readings in Sociology

Courses numbered 300 and above 9

Electives 7

Total Credits 22

Courses

SOC 110. Introduction to Sociology. 3 Credits.
An introductory analysis of the nature of society, the interrelationships of its component groups and the process whereby society persists and changes. Interpretation of human behavior from the standpoint of the group. Students wishing to earn credit from SOC 110 by means of independent study should obtain information from the University counseling center on the CLEP examinations administered there. 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.
An introductory survey of the racial, ethnic and cultural mosaic of American Society. Basic theories of intergroup relations, prejudice and discrimination are covered. Prerequisite: SOC 110. S.

SOC 252. Criminology. 3 Credits.
The extent and character of crime in the United States. A critical examination of the meaning and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior. F,S.

SOC 253. Juvenile Delinquency. 3 Credits.
The nature, extent, causes and treatment of delinquency. Delinquency prevention programs are explored. 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. Prerequisite: SOC 110. F.

SOC 306. Social Change. 3 Credits.
Theoretical models of socio-cultural change and stability; examination of changes occurring in American institutions and international relations; technology and social change; procedures and problems of planned change. F.

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.
A general consideration of methods involved in survey research in the social sciences. F,S.

SOC 326. Sociological Statistics. 3 Credits.
This course introduces the student to calculation and application of basic statistical techniques employed by sociologists. 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. Prerequisite: SOC 110. On demand.

SOC 335. The Family. 3 Credits.
Structure and function of the family, comparative family systems, sociology of family life stages (such as courtship, marriage, parenthood, old age), contemporary trends and problems of the family. F.

SOC 340. Sociology of Gender and Sex Roles. 3 Credits.
The implications of gender for social behavior in cross-cultural and historical perspective as well as in contemporary Western society. Prerequisite: SOC 110 or SOC 115 or SOC 250. S.

SOC 352. Aging. 3 Credits.
Socialization theory and its implication for the aging process. S.

SOC 354. Medical Sociology. 3 Credits.
Sociological analysis of health care definitions and roles, and the organization, availability and control of health care. Prerequisite: SOC 110 or SOC 115. F.

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.

Minor in Sociology

Required 22 credits, including:

SOC 301 Basic Sociological Theory 3
SOC 323 Sociological Research Methods 3

Courses numbered 300 and above 9
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 & 374L Environmental Remote Sensing 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 astrophysics, 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 cosmology and astrophysics 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 plesiosaurs). 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 atmospheres 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, 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.

Teaching and Learning (T&L)
http://www.und.edu/dept/tlt/

Baker (Chair), Barrentine, Beck, Burns, Chalmers, Chiasson, Combs, Gallo, Glessner, Gourneau, Grave, Guy, Helgeson, Houghton, Holen, Hung, Ingwason, Jacobson, Keengwe, Mahar, Olson, Onchwari, Ozaki, Pearson, Rogers, Salyers, Shafer, Smart, Terras, Van Eck, Walker, Yearwood and Zidon

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 preservice 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
- Spanish

The appropriate sequences of courses and experiences for these majors are outlined under the specific departments offering the majors. Kindergarten through grade 12 majors are also available in music and physical education.

All teacher licensure programs require program admission. Please refer to the College of Education and Human Development (p. 604) website for information regarding admission to teacher education, graduation and teacher licensure requirements, and other requirements of teacher education students.

**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 adviser(s). In addition, candidates in all majors must take the appropriate Praxis II exams prior to student teaching.

**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>
<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 328</td>
<td>Survey of Children's Literature</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 335</td>
<td>Understanding Readers and Writers</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 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 411</td>
<td>Primary Reading and Language Arts</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</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>
</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>10</td>
</tr>
<tr>
<td>TEAM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T&amp;L 410</td>
<td>Teaching Reading in the Elementary School Classroom (TEAM)</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 430</td>
<td>Social Studies in the Elementary School (Team)</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 440</td>
<td>Mathematics in Elementary School (Team)</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 470</td>
<td>Science in the Elementary School (TEAM)</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>13</td>
</tr>
<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 489</td>
<td>Senior Capstone: Responsive Teaching</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 Graduation Requirements (see University ES listing).

II. EHD General Graduation Requirements (see EHD listing).

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):

- HIST 101 Western Civilization I 3
- HIST 102 Western Civilization II 3
- HIST 103 United States to 1877 3
- HIST 220 History of North Dakota 3
- MATH 103 College Algebra 3

Total Credits 15

* A higher level math or qualify 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 requirements.

These requirements may be impacted by change at the federal and state level.

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:

- 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 3
- 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

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 1-4
- ENGL 209 Introduction to Linguistics 3
- ENGL 309 Modern Grammar 3
- ENGL 370 Language and Culture 3
- ENGL 418 Second Language Acquisition 3
- ENGL 419 Teaching English as a Second Language 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:

- T&L 250 Introduction to Education 3
- T&L 286 Field Experience 1
- 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
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.

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 338 Home, School and Community Relations 3
T&L 453 Methods and Materials: Kindergarten 2
T&L 486 Field Experience 1-4
T&L 487 Student Teaching 3

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. The following Middle Level Education (Grades 5-8) Curriculum:

T&L 250 Introduction to Education 3
T&L 315 Education of Exceptional Students 3
or T&L 319 Inclusive Strategies 3
T&L 339 Technology for Teachers 2

Admission to teacher education is required for enrollment in all of the following courses:

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 432 Learning Environments 2-3
T&L 433 Multicultural Education 3
T&L 465 Middle Level Curriculum and Methods 5
T&L 486 Field Experience 1-4

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 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.

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:

T&L 250 Introduction to Education 3
T&L 315 Education of Exceptional Students 3
or T&L 319 Inclusive Strategies 3
T&L 339 Technology for Teachers 2

Admission to teacher education is required for enrollment in all of the following courses:

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 432 Learning Environments 2-3
T&L 433 Multicultural Education 3
T&L 465 Middle Level Curriculum and Methods 5
T&L 486 Field Experience 1-4

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 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 3
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.

Students enrolled in a discipline specific Senior Seminar need not enroll in T&L 488.

Students enrolled in a discipline outside of the Department of Teaching & Learning AND taking a capstone from another department, need not enroll in T&L 489.

Mathematics majors with Teacher Licensure must take Math 399 and Math 400 in place of T&L 400.

B.S.ED. with Major in Science

Required 146 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

<table>
<thead>
<tr>
<th>Physics</th>
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<tbody>
<tr>
<td>PHYS 211 &amp; PHYS 211L</td>
<td>University Physics I and (requires dept. approval to waive Calculus III) 4</td>
</tr>
<tr>
<td>PHYS 212 &amp; PHYS 212L</td>
<td>College Physics III and University Physics I and (requires dept. approval to waive Calculus III) 4</td>
</tr>
<tr>
<td>PHYS 253 &amp; PHYS 253L</td>
<td>University Physics II and (requires departmental approval) 4</td>
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<tr>
<td>PHYS 254 &amp; PHYS 254L</td>
<td>University Physics III and (requires departmental approval) 4</td>
</tr>
<tr>
<td>PHYS 255 &amp; PHYS 255L</td>
<td>University Physics IV and (requires departmental approval) 4</td>
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Chemistry

CHEM 112 & 112L General Chemistry I 4
CHEM 112 & 112L General Chemistry II 4
CHEM 122 & 122L General Chemistry II Laboratory 4
CHEM 133 & 133L Analytical Chemistry Laboratory 4

Earth Science

PHYS 110 & 110L Introductory Astronomy and Introductory Astronomy Lab 4
PHYS 251 & 251L University Physics I and University Physics I Laboratory 4
PHYS 252 & 252L University Physics II and University Physics II Laboratory 4
PHYS 253 & 253L University Physics III and University Physics III Laboratory 4
PHYS 254 & 254L University Physics IV and University Physics IV Laboratory 4

Biology

Biol 120 General Biology I and General Biology I Laboratory 4
Biol 130 General Biology II and General Biology II Laboratory 4
Biol 131 Evolution and Genetics 4-6
Biol 132 Systematic Botany 4
Biol 133 General Ecology and Gen Ecology Lab 4
Biol 134 & 134L Introduction to Global Climate and Introduction to Global Climate Laboratory 4

Math (Minimum 8 credits)

MATH 165 Calculus I 4
MATH 166 Calculus II 4

Select one of the following: 3-4

MATH 211 Applied Statistical Methods
MATH 241 Introduction to Statistics
ECON 210 Introduction to Business and Economic Statistics

IV. In addition to the Secondary Education Licensure Preparation, B.S.Ed. Science Students must take T&L 401 School Safety Science (1 cr).

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

<table>
<thead>
<tr>
<th>History</th>
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<tbody>
<tr>
<td>HIST 101</td>
<td>Western Civilization I 3</td>
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<tr>
<td>HIST 102</td>
<td>Western Civilization II 3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>United States to 1877 3</td>
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<tr>
<td>HIST 104</td>
<td>United States since 1877 3</td>
</tr>
<tr>
<td>HIST 220</td>
<td>History of North Dakota 3</td>
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</tbody>
</table>
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

Footnotes

Note: To teach any one of the electives in North Dakota requires 6 credits in the subject.

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

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 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 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.

Note: All courses completed for the minor must be taken in addition to those taken for the major. It is recommended that all students pursuing this minor complete T&L 335 Understanding Readers and Writers early in the course sequence as it is a prerequisite for more advanced reading courses.

Required Courses for the Elementary Education Major and 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:

- T&L 313 Language Development and Emerging Literacy (Fall) 7
- T&L 411 Primary Reading and Language Arts (Fall & Spring - Elementary only) 7
- T&L 416 Adolescent Literacy Development (Fall) 7

Total Credits 69-70
T&L 486  Field Experience (in Literacy or ESL)  
T&L 329  Young Adult Literature  
or ENGL 359  Young Adult Literature  

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 418  Field Experience (in Literacy or ESL)  3
T&L 329  Young Adult Literature  
or ENGL 359  Young Adult Literature

Total Credits  23-28

- May not count towards minor if taken for major.
- 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/Spedc edu/. 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. 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,SS.

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, SS.

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, SS.

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.

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. 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 414. Corrective Reading Practicum. 2 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 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 ELs 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 335 and T&L 328. F, S.

T&L 421. 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 included in the course. Prerequisite: Admission to the Teacher Education program. F.S.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.S.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 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 tutorial 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

Burgess, Cherry, Gunther, 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. The Department offers a Master of Arts degree at the graduate level (see Graduate section (p. 591) for details). All undergraduate theatre majors share a common set of core courses. The Bachelor of Arts offers a well-rounded 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 desire 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.

The Burtness Theatre facility and the adjacent Chandler Hall house offices, labs, and classrooms for Theatre Arts. The Burtness Theatre building boasts a fully-equipped, 365 seat, proscenium-stage and Blackbox (Lab) Theatre. Chandler Hall is home to an acting/movement and voice studio, a high-tech lecture classroom, a computer design studio, a conference room, rehearsal space, student stage manager and publicity offices, a student lounge, and faculty offices.

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 vocal ability and acting, 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.

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 number</th>
<th>Course name</th>
<th>Credits</th>
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</thead>
<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 133</td>
<td>Keyboard Skills I</td>
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<tr>
<td></td>
<td>Choral Ensemble (audition required)</td>
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<tr>
<td></td>
<td>Individual Lessons (taken every semester)*</td>
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Theatre Courses

<table>
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<tr>
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<tr>
<td>THEA 110</td>
<td>Introduction to Theatre Arts</td>
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<tr>
<td>THEA 120</td>
<td>Voice and Movement I</td>
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</tr>
<tr>
<td>THEA 161</td>
<td>Acting I</td>
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<tr>
<td>THEA 201</td>
<td>Theatre Practicum</td>
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<tr>
<td>THEA 220</td>
<td>Voice and Movement II</td>
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<tr>
<td>THEA 230</td>
<td>Text Analysis</td>
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<tr>
<td>THEA 240</td>
<td>Ballet I</td>
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<td>THEA 241</td>
<td>Jazz Dance I</td>
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<td>THEA 242</td>
<td>Tap Dance</td>
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<td>THEA 260</td>
<td>Costume Craft</td>
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<td>THEA 270</td>
<td>Stagecraft</td>
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<tr>
<td>THEA 271</td>
<td>Intermediate Acting I: The Actor in You</td>
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<tr>
<td>THEA 204</td>
<td>Introduction to Acting for Musical Theatre</td>
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<tr>
<td>THEA 300</td>
<td>Play Direction I</td>
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<tr>
<td>THEA 371</td>
<td>Advanced Acting: Advanced Scene Study</td>
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<td>THEA 344</td>
<td>Musical Theatre Dance Style</td>
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<td>THEA 404</td>
<td>Acting for the Music Theatre</td>
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<tr>
<td>THEA 423</td>
<td>History of the Theatre: Classical, Medieval and Renaissance</td>
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<tr>
<td>THEA 424</td>
<td>History of the Theatre: Seventeenth Century to the Present</td>
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<tr>
<td>THEA 494</td>
<td>Senior Project</td>
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<td>THEA 450</td>
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Electives

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<tr>
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<td>THEA 330</td>
<td>Contemporary Theatre</td>
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<td>THEA 340</td>
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<td>Modern Dance II</td>
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<td>THEA 425</td>
<td>Play Direction II</td>
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<td>THEA 442</td>
<td>Choreography</td>
<td>3</td>
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<td>THEA 471</td>
<td>Advanced Acting III: Shakespeare</td>
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<tr>
<td>THEA 488</td>
<td>Playwriting</td>
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<td>MUSC 134</td>
<td>Music Theory II</td>
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<td>MUSC 135</td>
<td>Aural Skills II</td>
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<td>MUSC 136</td>
<td>Keyboard Skills II</td>
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<td>MUSC 242</td>
<td>Diction for Singers</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 269</td>
<td>Opera Workshop</td>
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<td></td>
<td>Others by Advisor Approval</td>
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</tbody>
</table>

* Course number for individual lessons determined at registration.

B.F.A. in Musical Theatre with a Major in Theatre Arts (p. 3) B.A. with a Major in Theatre Arts (p. 3)
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
All BA Theatre Students Must Complete the Following:

THEA 110  Introduction to Theatre Arts 3
THEA 161  Acting I 3
THEA 201  Theatre Practicum 1
THEA 230  Text Analysis 3
THEA 260  Costume Craft 3
THEA 270  Stagecraft 3
THEA 300  Play Direction I 3
or THEA 335  Stage Management 3
THEA 330  Contemporary Theatre 3
THEA 423  History of the Theatre: Classical, Medieval and Renaissance 3
THEA 424  History of the Theatre: Seventeenth Century to the Present 3

Students Select One of the Following Tracks:

Acting Track
THEA 271  Intermediate Acting I: The Actor in You 3
THEA 371  Advanced Acting: Advanced Scene Study 3
THEA 120  Voice and Movement I 2
THEA 220  Voice and Movement II 2
THEA 204  Introduction to Acting for Musical Theatre 3

Design/Tech Track
THEA 225  Makeup for the Stage 3
THEA 427  Costume Design 3
THEA 426  Scene Design for the Stage 3
THEA 326  Lighting for Stage I 3
THEA 201  Theatre Practicum 1

Generalist Track
Level II Proficiency in a Foreign Language
THEA 300  Play Direction I (Generalists are required to take THEA 300 AND THEA 335) 3
or THEA 335  Stage Management 3
THEA 201  Theatre Practicum (1 credit, to be repeated for 2 credits) 2

Minor in Theatre Arts

Required 25 credits, including:

THEA 110  Introduction to Theatre Arts 3
THEA 161  Acting I 3
THEA 201  Theatre Practicum 1
THEA 330  Contemporary Theatre 3
Select one of the following:
THEA 260  Costume Craft
THEA 270  Stagecraft

Select one of the following:

THEA 300  Play Direction I
THEA 335  Stage Management

Select one of the following:

THEA 423  History of the Theatre: Classical, Medieval and Renaissance
THEA 424  History of the Theatre: Seventeenth Century to the Present

Select two of the following:
THEA 225  Makeup for the Stage
THEA 230  Text Analysis
THEA 271  Intermediate Acting I: The Actor in You
THEA 326  Lighting for Stage I
THEA 425  Play Direction II
THEA 426  Scene Design for the Stage
THEA 427  Costume Design
THEA 488  Playwriting

Total Credits 25

Minor in Dance

Required 20 credits, including:

Select six of the following (Dance Technique):
THEA 240  Ballet I
THEA 241  Jazz Dance I
THEA 242  Tap Dance
THEA 243  Modern Dance I
THEA 340  Ballet II
THEA 341  Jazz Dance II
THEA 342  Modern Dance II
THEA 344  Musical Theatre Dance Style
& THEA 161  and Acting I
THEA 442  Choreography

Select two of the following:
THEA 201  Theatre Practicum
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 130. The Art and Craft of Theatre. 3 Credits.
Introduction to basic principles, theory, and techniques of theatrical performance. Examines theatre with emphasis on participatory roles. For prospective majors and minors. 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.S.SS.

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.

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. 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. F.

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. F.

THEA 243. Modern Dance I. 2 Credits.
Introduction to the elements of modern 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. S.

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. S, even years.

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. Prerequisites: THEA 110 or THEA 130. S.

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 272. Intermediate Acting II: Script Analysis & Meisner. 3 Credits.
Script analysis through the study of contemporary scripts using Stanislavsky-based and Meisner-based methodology. Prerequisites: THEA 271. S.

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.

THEA 320. Voice and Movement III. 2 Credits.
A sequential continuation of THEA 220. Vocal emphasis on shaping and musically of sounds and words, articulation, love of language and vocal flexibility. Physical emphasis on freedom, flexibility, and integration. Prerequisites: THEA 220. F.

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, craftsmen, 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. 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. F.

THEA 342. Modern Dance II. 2 Credits.
In this course students will continue to refine the skills learned in Modern Dance I and explore the principles and techniques characteristic of modern 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. 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 repertoire from the classic musical theatre. Prerequisites: THEA 241. S.

THEA 350. Dramatic Production and Criticism. 3 Credits.
An examination of the principles of production criticism and the application of those principles to a series of theatrical productions. F, even years.

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, even 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 420. Voice and Movement IV. 2 Credits.
A continuation of THEA 320 with emphasis on specialized and advanced voice and movement skills. Prerequisites: THEA 320. S.

THEA 422. American Theatre History. 3 Credits.
The development of Theatre Arts in America from Colonial times to the present. 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.

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.

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.

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, S.

THEA 471. Advanced Acting III: Shakespeare. 3 Credits.
A detailed examination of Shakespeare in performance. Prerequisite: THEA 371. F.

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, S.

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 or 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 (repeatable with permission of the student's academic department). 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. Prerequisites: Sophomore status and a cumulative GPA of 2.5. Repeatable. F,S,SS.

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 study (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 inequity. 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.

College of Arts and Sciences

Major in Interdisciplinary Studies: Women and Gender Studies

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

II. Interdisciplinary Studies Program Requirements:
A minimum of 36 credits, including:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<td>IDS 280</td>
<td>Learning Across Disciplines</td>
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<tr>
<td>IDS 491</td>
<td>Capstone Interdisciplinary Seminar (not repeatable)</td>
<td>1-3</td>
</tr>
<tr>
<td>IDS 498</td>
<td>Senior Project (repeatable to 6)</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students prepare a program of study listing the courses to be used to complete major requirements, which must be approved by an IDS adviser and the IDS Executive Committee before no more than a third of the courses have been completed.

III. Women and Gender Studies Requirements (21 credits min.):

<table>
<thead>
<tr>
<th>Course</th>
<th>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>ENGL 357</td>
<td>Women Writers and Readers (repeatable when topics vary)</td>
<td>3</td>
</tr>
</tbody>
</table>

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</th>
<th>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</th>
<th>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 and Sex Roles</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>Victimology</td>
<td>3</td>
</tr>
<tr>
<td>IS 346</td>
<td>American Indian Women</td>
<td>3</td>
</tr>
<tr>
<td>SOC 335</td>
<td>The Family</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.

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 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 assessments of women's contributions to Western culture. 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 requirement 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. in American Indian Studies
B.A. in Anthropology
B.S. in Biology
B.S. in Chemistry
B.A. in Communication
B.A. in Communication Sciences and Disorders
B.A./B.S in Computer Science
B.S. in Criminal Justice Studies
B.A. in Economics
B.A. in English
B.S. Forensic Science
B.S. in Geography
B.F.A. in Graphic Design and New Art Media
B.A. in History
B.A. or B.S. in Honors
B.M. in Instrumental Performance
B.A. in International Studies
B.A. in Language: Chinese Studies; Classical Studies; French; German Studies; Norwegian; Spanish
B.S. in Mathematics
B.A. in Music
B.M. in Music Education
B.M. in Music Therapy
B.F.A. in Musical Theatre
B.A. in Philosophy and Religion
B.S. in Physics

B.A. or B.S. in Psychology
B.A. in Sociology
B.A. in Theatre Arts
B.A. or B.F.A. in Visual Arts
B.M. in Vocal Performance

American Indian Studies

B.A. in American Indian Studies A (AIS as second major)
B.A. in American Indian Studies B (four years; even year freshman enrollment)
B.A. in American Indian Studies C (four years; uneven year freshman enrollment)

B.A. in American Indian Studies A (AIS as second major)

Freshman Year
Summer

<table>
<thead>
<tr>
<th>Essential Studies/First Major/Electives</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
</tr>
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</table>

Fall

<table>
<thead>
<tr>
<th>Essential Studies/First Major/Electives</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
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</table>

Spring

<table>
<thead>
<tr>
<th>Essential Studies/First Major/Electives</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
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</table>

Sophomore Year
Summer

<table>
<thead>
<tr>
<th>First Major/Essential Studies/Electives</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
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Fall

<table>
<thead>
<tr>
<th>First Major/Essential Studies/Electives</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
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</tbody>
</table>

Spring

<table>
<thead>
<tr>
<th>First Major/Essential Studies/Electives</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

Junior Year
Summer

Recommended: Internship (IS 430) or Elective/First Major/Essential Studies

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>3</td>
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</table>

Fall

<table>
<thead>
<tr>
<th>Elective/First Major/Essential Studies</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 121 or IS 122 or IS 123</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to American Indian Studies or American Indians and Tradition or American Indians and Culture</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
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</table>

Spring

<table>
<thead>
<tr>
<th>Electives/First Major/Essential Studies</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>IS 348</td>
<td>3</td>
</tr>
<tr>
<td>Beyond the Reservation</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>15</td>
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</tbody>
</table>

Senior Year
Fall

<table>
<thead>
<tr>
<th>Electives/First Major/Essential Studies</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 240</td>
<td>3</td>
</tr>
<tr>
<td>Research and Writing in Indian Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
</tr>
</tbody>
</table>
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. in American Indian Studies B (four years; even year freshman enrollment)

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>6</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>IS 121</td>
<td>3</td>
</tr>
<tr>
<td>or IS 122</td>
<td>3</td>
</tr>
<tr>
<td>or IS 123</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>6</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>American Indian Studies elective</td>
<td>3</td>
</tr>
<tr>
<td>IS 240</td>
<td>3</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Credits</td>
<td>12</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td>IS 395</td>
<td>3</td>
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</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>3</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>3</td>
</tr>
<tr>
<td>Fall</td>
<td>9</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>9</td>
</tr>
<tr>
<td>IS 230</td>
<td>3</td>
</tr>
<tr>
<td>IS 360</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td>IS 348</td>
<td>3</td>
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</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td>IS 410</td>
<td>3</td>
</tr>
</tbody>
</table>

### B.A. in American Indian Studies C (four years; uneven year freshman enrollment)

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>6</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>IS 121</td>
<td>3</td>
</tr>
<tr>
<td>or IS 122</td>
<td>3</td>
</tr>
<tr>
<td>or IS 123</td>
<td>3</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>12</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>6</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>IS 230</td>
<td>3</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>6</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td>IS 348</td>
<td>3</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>3</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
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<tr>
<td>Fall</td>
<td>9</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>9</td>
</tr>
<tr>
<td>IS 240</td>
<td>3</td>
</tr>
<tr>
<td>IS 360</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>15</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
<td>15</td>
</tr>
<tr>
<td>IS 395</td>
<td>3</td>
</tr>
<tr>
<td>IS 410</td>
<td>3</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>12</td>
</tr>
<tr>
<td>Elective/Essential Studies/Second Major</td>
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</tbody>
</table>
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Anthropology

B.A. in Anthropology

Freshman Year

Fall
ANTH 170
or ANTH 171
or ANTH 172
Introduction to Biological Anthropology
or Introduction to Cultural Anthropology
or Introduction to Archaeology
ENGL 110
College Composition I
General Electives
Essential Studies: Social Science
Essential Studies: Arts
Credits
15

Spring
Essential Studies: Science Lab
Essential Studies: Humanities (U)
ANTH 171
or ANTH 170
or ANTH 172
Introduction to Cultural Anthropology
or Introduction to Biological Anthropology
or Introduction to Archaeology
ENGL 130
Composition II: Writing for Public Audiences
Essential Studies: Social Science
Essential Studies: Arts
Credits
16

Sophomore Year

Fall
ANTH 172
or ANTH 170
or ANTH 171
Introduction to Archaeology
when not already taken.
or Introduction to Biological Anthropology
or Introduction to Cultural Anthropology
Concentration Electives
9 credits in the concentration must be taken at 300 level or above.
Essential Studies: Math, Science and Technology (Q)
Essential Studies: Arts or Humanities
General Electives
Credits
15

Spring
Cultural Anthropology Method or Theory
ANTH 350
Ethnographic Methods
or ANTH 371
or ANTH 372
or Cultural Dynamics
or Culture Theory
Anthropology Electives
General Electives
Concentration Electives
Credits
15

Junior Year

Fall
Biological Anthropology Method or Theory
### B.S. 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>1</td>
</tr>
<tr>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>4</td>
</tr>
<tr>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; 121L</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146</td>
<td>3-4</td>
</tr>
<tr>
<td>or MATH 165</td>
<td></td>
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<tr>
<td>or Calculus I</td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td>15-16</td>
</tr>
</tbody>
</table>

#### Spring

| BIOL 151              | 4       |
| General Biology I     |         |
| & 151L                |         |
| CHEM 122              | 4       |
| General Chemistry I   |         |
| & 122L                |         |
| ENGL 130              | 3       |
| Composition II: Writing for Public Audiences | 3 |
| COMM 110              | 3       |
| **Essential Studies Elective** | 3-4 |

**Credits** 17-18

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 315</td>
<td>4</td>
</tr>
<tr>
<td>Genetics &amp; 315R</td>
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</tr>
<tr>
<td>BIOL 332</td>
<td>4</td>
</tr>
<tr>
<td>General Ecology &amp; 332L</td>
<td></td>
</tr>
<tr>
<td>CHEM 341</td>
<td>5</td>
</tr>
<tr>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; 341L</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>General Electives</td>
<td>5</td>
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<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Credits** 21-22

#### Spring

| BIOL 312              | 4       |
| Evolution & 312R      |         |
| BIOL 341              | 3       |
| Cell Biology          |         |
| CHEM 342              | 5       |
| Organic Chemistry II  |         |
| & 342L                |         |
| OR                    |         |
| Survey of Organic Chemistry & 340L | 5 |
| **Essential Studies Elective** | 3-4 |

**Credits** 23-25

#### Junior Year

<table>
<thead>
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<tbody>
<tr>
<td>BIOL 470</td>
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<tr>
<td>Biometry</td>
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<tr>
<td>PHYS 211</td>
<td>4</td>
</tr>
<tr>
<td>College Physics I</td>
<td></td>
</tr>
<tr>
<td>Biology Elective</td>
<td>3-4</td>
</tr>
<tr>
<td><strong>General Elective</strong></td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Essential Studies Elective</strong></td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Credits** 17-20

#### Spring

| BIOL 376              | 4       |
| Animal Biology        |         |
| & 376L                |         |
| OR                    |         |
| BIOL 350              | 3       |
| Plant Biology (offered in odd years only) | 3 |
| PHYS 212              | 4       |
| College Physics II    |         |
| **Biology Elective**  |         |
| **General Elective**  |         |
| **Essential Studies Elective** |         |

**Credits** 15-16

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. 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.

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. in Biology, Fisheries and Wildlife

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 121</td>
<td>1</td>
</tr>
<tr>
<td>Introduction to Fisheries and Wildlife Biology</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>4</td>
</tr>
<tr>
<td>General Biology I</td>
<td></td>
</tr>
<tr>
<td>&amp; 150L</td>
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<tr>
<td>CHEM 121</td>
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<td>General Chemistry I</td>
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<tr>
<td>&amp; 121L</td>
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</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>College Composition I</td>
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</tr>
<tr>
<td><strong>Essential Studies Elective</strong></td>
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</table>

**Credits** 15-16
## B.S. in Biology - General Option

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>General Biology I &amp; 150L or General Biology I Laboratory</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I &amp; 121L or General Chemistry I Laboratory</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>MATH 120</td>
<td>Applied Calculus I or MATH 150L or Calculus I</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>15-16</strong></td>
</tr>
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</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 315</td>
<td>Genetics</td>
</tr>
<tr>
<td>&amp; 315R</td>
<td>and Genetics Recitation</td>
</tr>
<tr>
<td>BIOL 318 &amp; 332l</td>
<td>Gen Ecology &amp; Gen Ecology Lab</td>
</tr>
<tr>
<td>BIOL 396</td>
<td>Fisheries and Wildlife Biology Pre-Internship Seminar</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology &amp; 101L or Introduction to Geology Laboratory</td>
</tr>
<tr>
<td>BIOL 332</td>
<td>Population Biology</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16-17</strong></td>
</tr>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 336</td>
<td>Systematic Botany or Conservation Biology</td>
</tr>
<tr>
<td>or BIOL 439</td>
<td></td>
</tr>
<tr>
<td>BIOL 397</td>
<td>Cooperative Education</td>
</tr>
<tr>
<td>BIOL 431</td>
<td>Wildlife Management or Techniques in Wildlife Population Assessment</td>
</tr>
<tr>
<td>or BIOL 432</td>
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</tr>
<tr>
<td>BIOL 470</td>
<td>Biometry</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 336</td>
<td>Systematic Botany or Conservation Biology</td>
</tr>
<tr>
<td>or BIOL 439</td>
<td></td>
</tr>
<tr>
<td>BIOL 431</td>
<td>Wildlife Management or Techniques in Wildlife Population Assessment</td>
</tr>
<tr>
<td>or BIOL 432</td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>15-20</strong></td>
</tr>
</tbody>
</table>

### Spring

| BIOL 438      | Fisheries Management or Human Dimensions of Wildlife and Fisheries | 3-4 |
| or BIOL 430   | | |
| BIOL 481      | Fisheries & Wildlife Senior Capstone | 3 |
| GEOG 474      | Introduction to Geographic Information Systems (GIS) & 474L or GIS Laboratory | 3 |
| **Credits**   | **16-20** |

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 436, Biol 438) 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 & 342L | Organic Chemistry II and Organic Chemistry II Laboratory 3 | 5
OR
Essential Studies Elective | 3-4
General Elective | 3-4

Credits | 24-26

Junior Year
Fall
PHYS 211 | College Physics I | 4
BIOI 470 | Biometry or SOC 326 or Sociological Statistics | 3-4
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
BIOI 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
BIOI 480 | Senior Capstone Seminar (Or Biology Elective) 4 | 3-4
Biology Electives 4 | 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 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. 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 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/L 341/L, Chem 342/L 342/L, 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. in Biology - Molecular, Cellular, and Developmental Biology Option

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 120</td>
<td>Orientation to the Biology Major</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</td>
</tr>
<tr>
<td>MATH 146 or MATH 165</td>
<td>Applied Calculus I or Calculus I</td>
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</table>

Credits | 15-16

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<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>
</tr>
<tr>
<td>CHEM 341 &amp; 341L</td>
<td>Organic Chemistry I and Organic Chemistry I Laboratory 3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>General Electives</td>
<td>5</td>
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<tr>
<td>Essential Studies Elective</td>
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</table>

Credits | 17-18

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>BIOL 378</td>
<td>Developmental Biology</td>
</tr>
<tr>
<td>BIOL 470 or SOC 326</td>
<td>Biometry or Sociological Statistics</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>College Physics I</td>
</tr>
<tr>
<td>General Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
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Credits | 24-26

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMB 301</td>
<td>Biochemistry (Or General Elective) 3</td>
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### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 151 &amp; 151L</td>
<td>General Biology II and General Biology II Laboratory</td>
</tr>
<tr>
<td>CHEM 122 &amp; 122L</td>
<td>General Chemistry II and General Chemistry II Laboratory</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
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Credits | 20-21

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 312 &amp; 32R</td>
<td>Evolution and Evolution Recitation 1</td>
</tr>
<tr>
<td>BIOL 341 &amp; 341L</td>
<td>Cell Biology and Cell Biol Lab 2</td>
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<tr>
<td>CHEM 342 &amp; 342L</td>
<td>Organic Chemistry II and Organic Chemistry II Laboratory 3</td>
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<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>General Elective</td>
<td>3-4</td>
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</tbody>
</table>

Credits | 16-19
The B.S. major in Biology with the Molecular, Cellular, and Developmental Biology option is designed for students interested in cellular and sub-cellular process 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.

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, 341/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/L, Chem 342/L, and BMB 301 because some medical schools require or prefer this combination.

4 = A minimum of 8 credits of Biology Electives are required with at least 5 credits from the following list (Biol 315R, Biol 369, Biol 369/L, Biol 450, Biol 460, MBio 302, BMB 401). 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. in Biology, Molecular and Integrative - Basic Life Science Option

#### Freshman Year

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 120</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150 &amp; 150L</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110</td>
<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>BIOL 415</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 420 &amp; 420L</td>
<td>4</td>
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#### Sophomore Year

**Fall**

<table>
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 315 &amp; 315R</td>
<td>4</td>
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<tr>
<td>BIOL 332</td>
<td>3</td>
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<tr>
<td>CHEM 341 &amp; 341L</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 340 &amp; 340L</td>
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**Spring**

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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 312 &amp; 312R</td>
<td>4</td>
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<tr>
<td>BIOL 341 &amp; 341L</td>
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</tr>
<tr>
<td>CHEM 342 &amp; 342L</td>
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#### Junior Year

**Fall**

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<th>Course</th>
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<tbody>
<tr>
<td>BIOL 378 or 378L</td>
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<tr>
<td>BIOL 470 or SOC 326</td>
<td>3-4</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>4</td>
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**Spring**

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<tr>
<td>BIOL 415 or 415L</td>
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<tr>
<td>BIOL 460 or 460L</td>
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#### Senior Year

**Fall**

<table>
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</thead>
<tbody>
<tr>
<td>BIOL 410 or 410L</td>
<td>3-4</td>
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<tr>
<td>BIOL 442 or 442L</td>
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**Spring**

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<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 151 &amp; 151L</td>
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<tr>
<td>CHEM 122 &amp; 122L</td>
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<tr>
<td>ENGL 130</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110</td>
<td>3-4</td>
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</table>

**Total Credits:** 142-163
Enhanced Applied Life Science Option

B.S. in Biology, Molecular and Integrative-

http://und.edu/academics/essential-studies/requirements.cfm

Essential Studies requirements. Essential Studies requirements are found at

Please Note: Every student must fulfill all University, Departmental, and

because some medical schools require or prefer this combination.

Students considering medical school are encouraged to take Chem 341/341L, Chem 342/342L, and BMB 301

upper level lab requirement.

Students are required to take 4 upper level labs. These courses meet the

upper level lab requirement.

Organic chemistry requirement can be met either by taking Chem 341/L, 342/L, or 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.

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

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. 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.

B.S. in Biology, Molecular and Integrative-

Enhanced Applied Life Science Option

Freshman Year

Fall Credits
BIOL 120 Orientation to the Biology Major 1
BIOL 150 General Biology I 4
& 150L and General Biology I Laboratory
CHEM 121 General Chemistry I 4
& 121L and General Chemistry I Laboratory
ENGL 110 College Composition I 3
MATH 146 or MATH 165
or Calculus I 3-4

Credits 15-16

Spring Credits
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

Credits 17-18

Sophomore Year

Fall Credits
BIOL 315 Genetics 4
& 315R and Genetics Recitation 1
BIOL 332 General Ecology 3
CHEM 341 Organic Chemistry I 5
& 341L and Organic Chemistry I Laboratory 3
OR
General Electives 5
Essential Studies Elective 3-4
General Electives 4 3-4

Credits 23-25

Spring Credits
BIOL 312 Evolution 4
& 312R and Evolution Recitation 1
BIOL 341 Cell Biology 4
& 341L and Cell Biol Lab 2
CHEM 342 Organic Chemistry II 5
& 342L and Organic Chemistry II Laboratory 3
OR
CHEM 340 Survey of Organic Chemistry 5
and Survey of Organic Chemistry Laboratory 3
Essential Studies Elective 3-4
General Electives 4 3-4

Credits 24-26

Junior Year

Fall Credits
BIOL 378 Developmental Biology 4
& 378L and Developmental Biology Lab 2
BIOL 470 Biometry 3-4
or SOC 326 or Sociological Statistics
CHEM 333 Analytical Chemistry 3
PHYS 211 College Physics I 4
Essential Studies Elective 3-4

Credits 17-19

Spring Credits
BIOL 415 Genomics 2 4
BIOL 416 Ecological Genomics 2
or BIOL 418 or Systems Biology
BMB 301 Biochemistry 3 3
MBIO 302 General Microbiology Lecture
& 302L and General Microbiology Laboratory
PHYS 212 College Physics II 4

Credits 18

Senior Year

Fall Credits
BIOL 410 Molecular Biology Techniques 2
or BIOL 480 or Senior Capstone Seminar
BIOL 442 Physiology of Organs and Systems 4
& 442L and Physiology of Organs and Systems Laboratory 2
BMB 401 Biochemistry of Proteins and Information Flow 3
BMB 403 Advanced Biochemistry Laboratory 2
MBIO 328 Introduction to Immunology 3
Essential Studies Elective 3-4

Credits 18-20

Spring Credits
BIOL 410 Molecular Biology Techniques 2
or BIOL 480 or Senior Capstone Seminar
BIOL 416 Ecological Genomics 2
or BIOL 418 or Systems Biology
Biology Elective 3-4
General Elective 4 3-4
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.

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 and 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.

**B.S. in Biology - Pre-Health Sciences Emphasis**

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 120</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150 &amp; 150L</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121 &amp; 121L</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146 or MATH 165</td>
<td>3-4</td>
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**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 151 &amp; 151L</td>
<td>4</td>
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<tr>
<td>CHEM 122 &amp; 122L</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>3</td>
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<tr>
<td>COMM 110</td>
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<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Essential Studies Elective</td>
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| Credits | 15-16 |

**Sophomore Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BIOL 315 &amp; 315R</td>
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<tr>
<td>BIOL 332</td>
<td>3</td>
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<tr>
<td>CHEM 341 &amp; 341L</td>
<td>5</td>
</tr>
<tr>
<td>OR</td>
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<table>
<thead>
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<th>Course</th>
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</tr>
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<tbody>
<tr>
<td>Essential Studies Elective</td>
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**Spring**

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BIOL 470 or PSYC 241</td>
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</tr>
<tr>
<td>PHYS 211</td>
<td>4</td>
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<tr>
<td>Biology Elective</td>
<td>3-4</td>
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<tr>
<td>General Elective</td>
<td>3-4</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
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| Credits | 16-20 |

**Junior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>BIOL 480</td>
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</tr>
<tr>
<td>Biology Electives</td>
<td>6-8</td>
</tr>
<tr>
<td>General Elective</td>
<td>3-4</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies Elective</td>
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| Credits | 16-19 |

**Spring**

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>PHYS 212</td>
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<tr>
<td>BMB 301</td>
<td>3</td>
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<tr>
<td>Biology Electives</td>
<td>6-8</td>
</tr>
<tr>
<td>General Elective</td>
<td>3-4</td>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
</tbody>
</table>

| Credits | 15-20 |

**Senior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 480</td>
<td>3-4</td>
</tr>
<tr>
<td>Biology Electives</td>
<td>6-8</td>
</tr>
<tr>
<td>General Elective</td>
<td>3-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies Elective</td>
<td>3-4</td>
</tr>
</tbody>
</table>

| Credits | 15-20 |

| Total Credits | 138-160 |

The B.S. with Major in Biology with Pre-Health Science Emphasis is designed for students interested in medicine or allied medical fields. 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. Biol 341L could go toward the upper level lab requirement but students do not have to take Biol 341L.

3 = Organic chemistry requirement can be met either by taking Chem 341/L and BMB 301 or Chem 340/L. 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 20 credits of Biology Electives are required with at least 12 credits from the following list (Biol 341L, Biol 364/364L, Biol 369/369L, Biol 376/376L, Biol 378/378L, Biol 390, Biol 415, Biol 418, Biol 420, Biol 442/442L, Biol 450, Biol 460, MBio 328). 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

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## Chemistry

### B.S. in Chemistry - ACS Degree

### B.S. in Chemistry - Biochemistry Option

### B.S. in Chemistry - Physical Science Option

### B.S. in Chemistry - ACS Degree

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 101 Orientation to Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 221 Fundamentals of Chemistry - Concepts</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 221L Fundamentals of Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
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<td>Essential Studies Electives</td>
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</tbody>
</table>

#### Credits | 16

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 254 Inorganic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 254L Inorganic Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166 Calculus II</td>
<td></td>
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<tr>
<td>Essential Studies Electives</td>
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</table>

#### Credits | 15

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 333 Analytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 333L Analytical Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 341 Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 341L Organic Chemistry I Laboratory</td>
<td>1</td>
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<tr>
<td>CHEM 361 Problem Solving in Organic Chemistry I</td>
<td>1</td>
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<tr>
<td>PHYS 251 University Physics I</td>
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<tr>
<td>MATH 265 Calculus III</td>
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#### Credits | 17

<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>CHEM 342 Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 342L Organic Chemistry II Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 362 Problem Solving in Organic Chemistry II</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 252 University Physics II</td>
<td>4</td>
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<tr>
<td>Essential Studies &amp; Other Electives</td>
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#### Credits | 15

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>CHEM 454 Inorganic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 454L Inorganic Chemistry II Laboratory</td>
<td>1</td>
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<tr>
<td>CHEM 466 Fundamentals of Physical and Biophysical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry</td>
<td>2</td>
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#### Credits | 15

#### Level II Language

<table>
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#### Electives

<table>
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<tr>
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<tbody>
<tr>
<td>2</td>
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</table>

### Spring

| CHEM 471 Quantum Mechanics & Spectroscopy | 3       |
| CHEM 471R Quantum Mechanics & Spectroscopy Recitation | 1       |
| CHEM 441 Instrumental Analysis I - Spectroscopy | 2       |
| BMB 301 Biochemistry | 3       |
| Level II Language | 4       |
| Electives | 2       |

#### Credits | 15

#### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 455 Spectroscopy and Structure</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 462 Physical Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 492 Senior Research</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
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</table>

#### Credits | 15

#### Spring

| CHEM 442 Instrumental Analysis II - Electrochemistry | 2       |
| CHEM 488 Undergraduate Seminar | 1       |
| CHEM 492 Senior Research | 2       |
| Electives | 11      |

#### Credits | 15

#### Total Credits

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>125</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

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### B.S. in Chemistry - Biochemistry Option

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 101 Orientation to Chemistry</td>
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</tr>
<tr>
<td>CHEM 121 General Chemistry I</td>
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<tr>
<td>CHEM 121L General Chemistry I Laboratory</td>
<td>1</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
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<tr>
<td>BIOL 150 General Biology I</td>
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<td>BIOL 150L General Biology I Laboratory</td>
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</table>

#### Credits | 16

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5 A minimum of 20 credits of Biology Electives are required with at least 12 credits from the following list (Biol 341L, Biol 364/364L, Biol 369/369L, Biol 376/376L, Biol 378/378L, Biol 390, Biol 415, Biol 418, Biol 420, Biol 442/442L, Biol 450, Biol 460, MBio 328). 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
<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 101</td>
<td>Orientation to Chemistry 1</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I 3</td>
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<tr>
<td>CHEM 121L</td>
<td>General Chemistry I Laboratory 1</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I 3</td>
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<tr>
<td>MATH 165</td>
<td>Calculus I 1</td>
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<td>MATH 166</td>
<td>Calculus II 4</td>
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<tr>
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<tbody>
<tr>
<td>CHEM 333</td>
<td>Analytical Chemistry 3</td>
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<td>CHEM 333L</td>
<td>Analytical Chemistry Laboratory 1</td>
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<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 361</td>
<td>Problem Solving in Organic Chemistry I 1</td>
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<tr>
<td>PHYS 211</td>
<td>College Physics I 4</td>
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<table>
<thead>
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<th>Junior Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
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<tr>
<td>Level II Language</td>
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<td>Electives</td>
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<tbody>
<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>CHEM 362</td>
<td>Problem Solving in Organic Chemistry II 1</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>College Physics II 4</td>
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<td>Essential Studies Electives</td>
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<tr>
<td>Credits</td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>CHEM 467</td>
<td>Survey of Physical Chemistry Laboratory 2</td>
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<tr>
<td>BMB 401</td>
<td>Biochemistry of Proteins and Information Flow 3</td>
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<td>BMB 403</td>
<td>Advanced Biochemistry Laboratory 2</td>
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<td>Electives</td>
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</tr>
<tr>
<td>Credits</td>
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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Electives</td>
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<tr>
<td>Credits</td>
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</tbody>
</table>

| 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. General Education Requirements (see University GER listing).

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 (Biol 341), Genetics (Biol 315), or Microbiology (MBio 302/L). 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. in Communication

Freshman Year

Fall Credits
COMM 102 Communication and the Human Community 3
ENGL 110 College Composition I 3
Electives/Essential Studies 9

Credits 15
Spring
COMM 103 Information, Technology and Social Change 3
ENGL 130 Composition II: Writing for Public Audiences 3
Electives/Essential Studies 9

Credits 15
Sophomore Year

Fall Credits
COMM 110 Fundamentals of Public Speaking 3
or COMM 200 Introduction to Media Writing
COMM 201 Visual Communication 3
or COMM 212 Interpersonal Communication
or COMM 300 Communication and Society
or COMM 303 Principles of Public Relations

Credits 11
Spring
COMM 200 or COMM 110 Introduction to Media Writing or Fundamentals of Public Speaking 3

Credits 17

Senior Year

Fall Credits
CHEM 462 Physical Chemistry Laboratory 3
Electives 12

Credits 15
Spring
CHEM 442 Instrumental Analysis II - Electrochemistry 2
Electives 13

Credits 15
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 - 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

Communication Sciences and Disorders

B.A. in Communication Sciences and Disorders

Freshman Year

Fall Credits
MATH 103 College Algebra 3
BIOL 111 Concepts of Biology 3
ENGL 110 College Composition I 3
COMM 110 Fundamentals of Public Speaking 3
BIOL 111L Concepts of Biology Laboratory 1
PSYC 111 Introduction to Psychology 3

Credits 16
Spring
ENGL 130 Composition II: Writing for Public Audiences 3
A course in Fine Arts 3
A course in Chem or Phys 3
IS 121 Introduction to American Indian Studies 3
ENGL 209 Introduction to Linguistics 3

Credits 15
### Sophomore Year

**Fall**
- CSD 232 Survey of Communication Disorders [3]
- CSD 231 Anatomy and Physiology of the Speech and Hearing Mechanism [4]
- PSYC 241 Introduction to Statistics [4]
- CSD 223 Phonetics [3]

**Credits** [14]

**Spring**
- CSD 340 Normal Language Structure [3]
- PSYC 250 Developmental Psychology [4]
- A course in Teaching & Learning [3]
- CSD 235 Speech and Hearing Science [4]

**Credits** [17]

### Junior Year

**Fall**
- A course either in Fine Arts or Humanities [3]
- CSD 343 Language Development [3-4]
- CSD 343L Language Development Laboratory [2]
- CSD 431 Introduction to Audiology [3]
- PSYC 270 Abnormal Psychology [3]
- An elective [3]

**Credits** [17-18]

**Spring**
- Either PSYC 355 or SOC 352 or SWK 313 [3]
- CSD 434 Aural Rehabilitation [3]
- An elective [3]
- CSD 333 Articulation and Phonological Development and Disorders [3]

**Credits** [16]

### Senior Year

**Fall**
- CSD 400 School Programs in Speech-Language-Hearing [3]
- CSD 425 Language, Multiculturalism and Communication Disorders [3]
- CSD 440 Language Disorders I [3]
- CSD 484 Clinical Practicum I: Speech-Language Pathology [3]
- T&L 486 Field Experience [1-4]
- An elective [3]

**Credits** [16-19]

**Spring**
- CSD 485 Clinical Practicum II: Speech Language Pathology [3]
- CSD 422 Neuroanatomy of Communication Disorders [3]
- CSD 438 Craniofacial Anomalies [2]
- CSD 441 Language Disorders II [3]
- Either CSD 461 or HUM 408 [3]

**Credits** [14]

**Total Credits** [125-129]

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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

**Computer Science**

**B.A. in Computer Science**

**B.S. in Computer Science**
### B.S. in Computer Science

#### Freshman Year

<table>
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<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
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<td>CSCI 160</td>
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</tr>
<tr>
<td>MATH 107</td>
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<td>ENGL 110</td>
<td>3</td>
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<tr>
<td>E.S. Humanities Elective</td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CSCI 161</td>
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<td>MATH 208</td>
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</tr>
<tr>
<td>COMM 110</td>
<td>3</td>
</tr>
<tr>
<td>E.S. Social Science Elective</td>
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</tr>
<tr>
<td>ENGL 130</td>
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#### Sophomore Year

<table>
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<td>CSCI 289</td>
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<td>MATH 166</td>
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</tr>
<tr>
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#### Junior Year

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
<td>MATH 321</td>
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<td>E.S. Social Science Elective</td>
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<tr>
<td><strong>Credits</strong></td>
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<table>
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<tr>
<td>CSCI 370</td>
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<td>Approved Math Elective</td>
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<tr>
<td>Lab Science II</td>
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<tr>
<td>E.S. Humanities Elective</td>
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#### Senior Year

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**UND Electives** | **12**
**Credits** | **14**
**Total Credits** | **125**

---

**Criminal Justice Studies**

#### B.S. in Criminal Justice Studies

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
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<td>ENGL 110</td>
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<tr>
<td>SOC 253</td>
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<tr>
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<tbody>
<tr>
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<tr>
<td>CJ 270</td>
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#### Sophomore Year

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<tr>
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<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>CSCI 365</td>
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<tr>
<td>CSCI 370</td>
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<tr>
<td>Approved Math Elective</td>
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<tr>
<td>Lab Science II</td>
<td>4</td>
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<tr>
<td>General Electives</td>
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#### Junior Year

<table>
<thead>
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<tbody>
<tr>
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<td>SOC 323</td>
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<td>CJ 341</td>
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### Economics

**B.A. in Economics**

#### Freshman Year

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<th>Course</th>
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<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>
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<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>
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<tr>
<td></td>
<td>Essential Studies: Arts and Humanities (HUM)</td>
<td>3</td>
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<tr>
<td></td>
<td>Essential Studies/Special Emphasis: United States Diversity</td>
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<tr>
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<td><strong>Credits</strong></td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECON Electives (300 or above)</td>
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<tr>
<td></td>
<td>Course in Concentration Area (300 or above)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PHIL 460  Philosophy of Law</td>
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<tr>
<td></td>
<td>General Electives</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General Electives</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>ECON 303  Money and Banking</td>
<td>3</td>
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<tr>
<td></td>
<td>ECON 309  Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
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<tr>
<td></td>
<td>Essential Studies: Lab Science</td>
<td>4</td>
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<tr>
<td></td>
<td>Essential Studies/Special Emphasis: Advanced Communication</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Open Electives</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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#### Junior Year

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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</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>
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<tr>
<td></td>
<td>ECON 338  International Economics</td>
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<td></td>
<td><strong>Credits</strong></td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Electives in Economics</td>
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<td></td>
<td>Open Electives</td>
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<tr>
<td>Spring</td>
<td>Open Electives</td>
<td>9</td>
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<tr>
<td></td>
<td>Essential Studies Capstone</td>
<td>3</td>
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<tr>
<td></td>
<td>Electives in Economics</td>
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<tr>
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<td><strong>Total Credits</strong></td>
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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.

**English**

**B.A. in English**

**B.A. in English - Teacher Licensure**

**B.A. in English**

#### Freshman Year

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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<tr>
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<td><strong>Credits</strong></td>
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</table>

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.

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Electives/Essential Studies</td>
<td>9</td>
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</tr>
<tr>
<td>ENGL 110  College Composition I</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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#### Second Semester

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<tr>
<td>Language 102</td>
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<tr>
<td>Electives/Essential Studies</td>
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ENGL 130 Composition II: Writing for Public Audiences 3

**Sophomore Year**

**First Semester**
- ENGL 271 Reading and Writing about Texts 3
- ENGL 301 Survey of English Literature I or ENGL 303 Survey of American Literature 3

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.

**Second Semester**
- ENGL 302 Survey of English Literature II or ENGL 304 Survey of American Literature 3
- Language 201 4
- Electives/Essential Studies 6

**Junior Year**

**First Semester**
- Electives/Essential Studies 9
- English Electives 6

One English elective needs to satisfy the historical requirement for the major and focus on the literature of an earlier historical period.

**Second Semester**
- Electives/Essential Studies 9
- English Electives 6

**Senior Year**

**First Semester**
- English Elective 3
- Electives/Essential Studies 9
- ENGL 4XX 3

**Second Semester**
- English Elective 3
- Electives/Essential Studies 9
- ENGL 415 Seminar in Literature 3

**Total Credits** 125

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

**B.A. in English - Teacher Licensure**

**Freshman Year**

**Fall**
- Language 101 4
- ENGL 110 College Composition I 3

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 their Freshman year.

**Spring**
- Language 102 4
- Electives/Essential Studies 10
- ENGL 130 3

**Sophomore Year**

**Fall**
- Language 201 4
- English Elective 3

One English elective needs to satisfy the historical requirement for the major and focus on the literature of an earlier historical period.

**Spring**
- Language 202 4
- Elective/Essential Studies 3
- ENGL 272 Introduction to Literary Criticism 3
- ENGL 301 Survey of English Literature I or ENGL 303 Survey of American Literature 3

Students are required to talk 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.

**Junior Year**

**Fall**
- English Elective 3
- T&L 339 Curriculum Development and Instruction 3
- ENGL 309 Modern Grammar 3

**Spring**
- ENGL 359 Young Adult Literature 3
- ENGL 308 or ENGL 408 The Art of Writing Nonfiction or Writing for Digital Environments 3
- ENGL 415 Seminar in Literature 3
- T&L 350 Development and Education of the Adolescent 3
- T&L 433 Multicultural Education 3

**Senior Year**

**Fall**
- ENGL 4XX 3
- T&L 423 Assessment Program Planning/Special Needs Students 3
- Praxis 2 exam should be taken this semester (or the summer before)
- T&L 486 Field Experience 2
- T&L 416 Adolescent Literacy Development 3
- T&L 432 Learning Environments 3

**Spring**
- T&L 487 Student Teaching 13
- T&L 488 Senior Seminar 1

**Total Credits** 125
Forensic Science

B.S. Forensic Science Evidence Analyst Track

B.S in Forensic Science Evidence Technician Track

B.S. Forensic Science Evidence Analyst Track

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>BIOL 151</td>
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<td>CHEM 121</td>
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<td>CHEM 121L</td>
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<td>CHEM 122</td>
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<td>CHEM 122L</td>
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<td>MATH 166</td>
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<tbody>
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<td>CHEM 342</td>
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<tr>
<td>CHEM 342L</td>
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<td>CJ 210</td>
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<tr>
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<tr>
<td>Statistics course</td>
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<tr>
<td>If Chemistry double major see forensic science advisor</td>
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<table>
<thead>
<tr>
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<td>ANTH 346</td>
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<tr>
<td>BIOL 315</td>
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<td>BIOL 320</td>
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<table>
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<td>CJ 342</td>
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<td>BIOL 333</td>
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<td>BIOL 410</td>
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<td>ES Capstone</td>
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Total Credits 125

B.S. in Forensic Science Evidence Technician Track

<table>
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<td>BIOL 151L</td>
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<tbody>
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<tr>
<td>CJ 210</td>
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<td>ANTH 345</td>
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<td>PHYS 161</td>
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<td>PHYS 162</td>
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<td>Ethics Course</td>
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Total Credits 125

Geography

B.S. in Geography - Community and Urban Development Emphasis

B.S. in Geography - Environmental Geography Emphasis

B.S. in Geography - Geographic Education Emphasis - Teacher Licensure

---

The English major is flexible and this plan of study offers only one possible path through the major with teacher licensure. 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. Every student 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

B.S. Forensic Science Evidence Technician Track

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<td>BIOL 151</td>
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<td>BIOL 151L</td>
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<td>CHEM 121</td>
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<tr>
<td>CJ 210</td>
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<tr>
<td>ANTH 345</td>
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<tr>
<td>PHYS 161</td>
<td>4</td>
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<tr>
<td>PHYS 162</td>
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<td>Program Electives</td>
<td>3</td>
</tr>
<tr>
<td>ES Courses or Electives</td>
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<table>
<thead>
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<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 333</td>
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<table>
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<td>CJ 342</td>
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<tr>
<td>ES Courses (Capstone)</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
### B.S. in Geography - Community and Urban Development Emphasis

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 151 Human Geography</td>
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<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110 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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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>GEOG 121 Global Physical Environment</td>
<td>3</td>
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<tr>
<td>GEOG 121L Global Physical Environment Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 161 World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<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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<td>Elective</td>
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<tr>
<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences)</td>
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#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 262 Geography of North America I or any approved Essential Studies course that carries U.S. Diversity (U) credit</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>(from Fine Arts and Humanities)</td>
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<tr>
<td>Elective</td>
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<tr>
<td>(from Economics, Finance, Public Administration, Anthropology, Sociology, History and/or other social sciences)</td>
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<tr>
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<table>
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<td>(from Fine Arts and Humanities)</td>
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#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 322 Environmental Hazards or GEOG 374 Environmental Remote Sensing</td>
<td>3</td>
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<tr>
<td>GEOG 352 Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 377 Quantitative Applications in Geography</td>
<td>2</td>
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<tr>
<td>GEOG 377L Spatial Analysis Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 471 Cartography and Visualization</td>
<td>2</td>
</tr>
<tr>
<td>GEOG 471L Cartography and Visualization Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td>(from Geography or another department—see your advisor for a list of recommended courses)</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 457 Urban Geography and Planning</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 474 Introduction to Geographic Information Systems (GIS)</td>
<td>2</td>
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<tr>
<td>GEOG 474L GIS Laboratory</td>
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<tr>
<td>GEOG 459 Population Geography or GEOG 463 Regional Geography</td>
<td>3</td>
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<td>Electives</td>
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#### Senior Year

<table>
<thead>
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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

### B.S. in Geography - Environmental Geography Emphasis

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG 121 Global Physical Environment</td>
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<tr>
<td>GEOG 121L Global Physical Environment Laboratory</td>
<td>1</td>
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<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
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<tr>
<td>Electives</td>
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</tr>
<tr>
<td>(from Atmospheric Science, Biology, Chemistry, Computer Science, Civil Engineering, Geology and Geological Engineering, Math and/or Physics)</td>
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<th>Spring</th>
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<tbody>
<tr>
<td>GEOG 151 Human Geography</td>
<td>3</td>
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<tr>
<td>GEOG 161 World Regional Geography</td>
<td>3</td>
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<td>Essential Studies Elective</td>
<td>3</td>
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<td>(from Social Sciences—other than Geography)</td>
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<td>(from Fine Arts and Humanities)</td>
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<th>Second Semester</th>
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<tbody>
<tr>
<td>GEOG 262 Geography of North America I or any approved Essential Studies course that carries U.S. Diversity (U) credit</td>
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<td>Elective</td>
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<td>(from Fine Arts and Humanities)</td>
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#### Sophomore Year

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<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>GEOG 322 Environmental Hazards or GEOG 374 Environmental Remote Sensing</td>
<td>3</td>
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<td>GEOG 352 Economic Geography</td>
<td>3</td>
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<td>2</td>
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<td>GEOG 377L Spatial Analysis Laboratory</td>
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<tr>
<td>GEOG 471 Cartography and Visualization</td>
<td>2</td>
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<tr>
<td>GEOG 471L Cartography and Visualization Laboratory</td>
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<td>Elective</td>
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#### Total Credits

| **125** |
### Credits

#### Freshman Year

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<th>Course Name</th>
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<td>GEOG 151</td>
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<td>GEOG 161</td>
<td>World Regional Geography</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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#### Credits

- **Total Credits:** 15

#### Second Semester

<table>
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<tr>
<td>GEOG 121</td>
<td>Global Physical Environment</td>
<td>3</td>
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<tr>
<td>GEOG 121L</td>
<td>Global Physical Environment Laboratory</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<tr>
<td>GEOG 271</td>
<td>The Power of Maps</td>
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#### Credits

- **Total Credits:** 15

#### Junior Year

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<td>T&amp;L 250</td>
<td>Introduction to Education</td>
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#### Credits

- **Total Credits:** 16

#### Senior Year

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<tr>
<td>Fall</td>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
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<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
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<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
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#### Credits

- **Total Credits:** 17

#### Credits

- **Total Credits:** 15

#### Credits

- **Total Credits:** 125

**B.S. in Geography - Geographic Education Emphasis - Teacher Licensure**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>Fall</td>
<td>GEOG 471</td>
<td>Cartography and Visualization</td>
<td>2</td>
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<tr>
<td></td>
<td>GEOG 471L</td>
<td>Cartography and Visualization Laboratory</td>
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<td></td>
<td>GEOG 322</td>
<td>Environmental Hazards</td>
<td>3</td>
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<td>or Selected Topics in Physical Geography</td>
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<td>GEOG 374</td>
<td>Environmental Remote Sensing</td>
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<td>or GEOG 352</td>
<td>or Economic Geography</td>
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<td>GEOG 374L</td>
<td>Environmental Remote Sensing Laboratory</td>
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#### Credits

- **Total Credits:** 15

#### Credits

- **Total Credits:** 16

#### Credits

- **Total Credits:** 15

#### Credits

- **Total Credits:** 17

#### Credits

- **Total Credits:** 15

#### Credits

- **Total Credits:** 17

- **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
Electives 6
(from Geography or another department—see your advisor for a list of recommended courses)

**Senior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 433 Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 319 Inclusive Strategies</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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Credits 15

**Second Semester**

<table>
<thead>
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<tbody>
<tr>
<td>T&amp;L 487 Student Teaching</td>
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<td>T&amp;L 488 Senior Seminar</td>
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<tr>
<td>GEOG 454 Conservation and Sustainable Use of Natural Resources</td>
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Credits 17

**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 480 Advanced Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
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<tr>
<td>Essential Studies Elective</td>
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Credits 15

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
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<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>
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</tr>
<tr>
<td>Elective</td>
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Annual BFA Review

Credits 16

**Junior Year**

**Fall**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>200-300 Level Studio Art Course</td>
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<tr>
<td>400 Level Art History</td>
<td>3</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>
</tr>
<tr>
<td>Essential Studies Elective</td>
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<tr>
<td>Elective</td>
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Credits 15

**Senior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<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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Credits 15

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<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>
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<tr>
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<tr>
<td>Elective</td>
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</table>

BFA Art Exhibition

Credits 15

**Total Credits** 125

**History**

**B.A. in History - Option A**

**B.A. in History - Option A**

**B.A. 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[ES] Courses The History Department recommends that you speak with your advisor before registering for classes.</td>
<td>9-10</td>
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</table>

Credits 16-17

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</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>
</tr>
<tr>
<td>Select 2 ES courses. The History Department recommends that you speak with your advisor before registering for classes.</td>
<td>6-7</td>
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Credits 16-17

**Sophomore Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 230 Drawing II</td>
<td>3</td>
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<tr>
<td>ART 240 Printmaking I</td>
<td>3</td>
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<tr>
<td>ART 260 Color Photography</td>
<td>3</td>
</tr>
<tr>
<td>ART 382 Typography</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>
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Credits 18

**Spring**

<table>
<thead>
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<th>Credits</th>
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<tbody>
<tr>
<td>ART 245 Black and White Photography I</td>
<td>3</td>
</tr>
<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>
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<tr>
<td>Essential Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Elective</td>
<td>3</td>
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</tbody>
</table>

BFA Application

Credits 15

**Total Credits** 125
Sophomore Year

Fall
Take third semester foreign language class.
Select one ES course.
Take a 200 level History Course. The History Department recommends that you speak with your advisor before registering for classes.

HIST 240 The Historian’s Craft

Credits
13-14

Spring
Take fourth semester language class.
Select two ES courses.
Select an elective course. The History Department recommends that you speak with your advisor before registering for classes.
Take a 200 level History course.

Credits
16-17

Junior Year

Fall
Take one 300 level History courses.
Take two ES courses.
Take one elective course. The History Department recommends that you speak with your advisor before registering for classes.

Take HIST347.

Credits
16-17

Spring
Take 3 electives. The History Department recommends that you speak with your advisor before registering for classes.
Take two 300 or 400 level History courses.

Credits
15

Senior Year

Fall
Take one 300/400 level History course.
Take three electives. The History Department recommends that you speak with your advisor before registering for classes.

HIST 440 Research Capstone

Credits
15

Spring
Take four electives. The History Department recommends that you speak with your advisor before registering for classes.
Take two 300/400 level History courses.

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. 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 advisor before registering for classes.
Take three Essential Studies [ES] Courses.

Credits
15-16

Spring
Select four ES courses.

Credits
12-13

Sophomore Year

Fall
Take one course from minor field.
Select three ES courses.

HIST 240 The Historian’s Craft The History Department recommends that you speak with your advisor before registering for classes.

Credits
15-16

Spring
Take two courses in your minor.
Select two ES courses.
Take one History elective. The History Department recommends that you speak with your advisor before registering for classes.

Credits
15-16

Junior Year

Fall
Take one History elective.
Take one class in your minor.
Select two ES courses.

Take HIST347 The History Department recommends that you speak with your advisor before registering for classes.

Credits
16-17

Spring
Take two classes in minor.
Select two ES courses.
Take two History electives. The History Department recommends that you speak with your advisor before registering for classes.

Credits
18-19

Senior Year

Fall
Take one course from minor.
Take two History electives.
Take two open elective courses.

HIST 440 Research Capstone The History Department recommends that you speak with your advisor before registering for classes.

Credits
18

Spring
Take four open electives.
Take one History elective. The History Department recommends that you speak with your advisor before registering for classes.

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 Program

B.A. or B.S. in Honors

First Year

<table>
<thead>
<tr>
<th>Study Abroad - optional</th>
<th>Credits</th>
</tr>
</thead>
</table>

Fall

- HON 101: Inquiry in the Humanities
- 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.

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.

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
</table>

Third Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
</table>
| HON 391: Advanced Colloquium in the Humanities
- or HON 372: Advanced Social Science Colloquium on US Diversity
- or HON 392: Diversity
- or HON 393: Colloquium in the Social Sciences

Essential Studies Requirements/Second Major Requirements/Other areas of interest

| Credits |

Fourth Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
</table>
| HON 489: Senior Honors Thesis
- or HON 489: Senior Honors Thesis

Optional: Advanced Colloquium

Second Major Requirements/Other areas of interest

| Credits |

Spring

- HON 291: Colloquium in the Humanities
- or HON 292: Colloquium in Social Science
- or HON 293: Colloquium in the Sciences

Essential Studies requirements, Second Major requirements, or other areas of interest.

| Credits |

Second Year

<table>
<thead>
<tr>
<th>Study Abroad - optional</th>
<th>Credits</th>
</tr>
</thead>
</table>

Fall

- HON 292: Colloquium in Social Science
- or HON 291: Colloquium in the Humanities
- or HON 293: Colloquium in the Sciences

Essential Studies requirements, Second Major requirements, or other areas of interest.

| Credits |

Spring

- HON 250: Sophomore Portfolio Workshop
- or HON 272: Social Science Colloquium on US Diversity

Essential Studies requirements, Second Major requirements, or other areas of interest.

| Credits |

Third Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
</table>
| HON 391: Advanced Colloquium in the Humanities
- or HON 372: Advanced Social Science Colloquium on US Diversity
- or HON 392: Diversity
- or HON 393: Colloquium in the Social Sciences

Essential Studies Requirements/Second Major Requirements/Other areas of interest

| Credits |

Instrumental Performance

B.M. in Instrumental Performance (Even Fall Entry)

B.M. in Instrumental Performance - Piano (Even Fall Entry)

B.M. in Instrumental Performance (Odd Fall Entry)

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
</table>
| MUSC 130: Music Theory I
- or MUSC 278: Seminar for Collaborative Piano
- or MUSC 131: Aural Skills I
- or MUSC 154: Individual Lessons
- or MUSC 155: Individual Lessons
- or ENGL 110: College Composition I
- or Essential Studies Lab Science

| Credits |

Spring

- Essential Studies Math/Science/Technology (Q)
- or ENGL 130: Composition II: Writing for Public Audiences
- or MUSC 278: Seminar for Collaborative Piano
- or MUSC 154: Individual Lessons
- or Electives
- or MUSC 134: Music Theory II
- or MUSC 135: Aural Skills II
- or MUSC 155: Individual Lessons

| Credits |

Credits

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 adviser 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
### Sophomore Year

**Fall**
- **MUSC 254** Individual Lessons 1
- **COMM 110** Fundamentals of Public Speaking 3
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 256** Basic Conducting 2
- **MUSC 230** Music Theory III 3
- Essential Studies Humanities (Non-Music) 3
- **MUSC 231** Aural Skills III 1
- **MUSC 255** Individual Lessons 2

**Credits** 16

**Spring**
- **MUSC 278** Seminar for Collaborative Piano 1
- Essential Studies Social Science 3
- Electives 2
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 235** Aural Skills IV 1
- **MUSC 254** Individual Lessons 1
- **MUSC 255** Individual Lessons 2
- **MUSC 203** Music and Culture 3

**Credits** 17

### Junior Year

**Fall**
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 444** Applied Music Pedagogy 2
- Essential Studies Social Science (U) 3
- **MUSC 355** Individual Lessons 4
- **MUSC 277** Chamber Music Groups 1
- Essential Studies Math/Science/Technology 3
- **MUSC 359** Junior Recital 1

**Credits** 16

**Spring**
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 235** Aural Skills IV 1
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 254** Individual Lessons 1
- **MUSC 278** Seminar for Collaborative Piano 1
- Electives 2
- **MUSC 203** Music and Culture 3
- **MUSC 255** Individual Lessons 2
- Essential Studies Social Science 3

**Credits** 16

### Senior Year

**Fall**
- Electives 2
- **MUSC 455** Individual Lessons 4
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 277** Chamber Music Groups 1
- Music Electives 3
- Essential Studies Social Science 3

**Credits** 14

**Spring**
- Electives 2
- **MUSC 455** Individual Lessons 4
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 277** Chamber Music Groups 1
- **MUSC 490** Seminar in Music 3
- **MUSC 459** Senior Recital 1-2
- **MUSC 414** Piano Literature 3

**Credits** 15-16

**Total Credits** 125-126

---

1 = On Piano.
2 = On Secondary Instrument.

---

### B.M. in Instrumental Performance (Odd Fall Entry)

**Freshman Year**

**Fall**
- **MUSC 130** Music Theory I 3
- **MUSC 155** Individual Lessons 1 2
- **MUSC 131** Aural Skills I 1
- Essential Studies Lab Science 4
- **MUSC 154** Individual Lessons 2 1
- **MUSC 278** Seminar for Collaborative Piano 3 1

**Credits** 15

**Spring**
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 154** Individual Lessons 1
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **MUSC 134** Music Theory II 3
- Essential Studies Math/Science/Technology (Q) 3
- **MUSC 135** Aural Skills II 1
- **MUSC 155** Individual Lessons 2

**Credits** 16

**Sophomore Year**

**Fall**
- **COMM 110** Fundamentals of Public Speaking 3
- **MUSC 256** Basic Conducting 2
- Essential Studies Humanities (Non-Music) 3
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 230** Music Theory III 3
- **MUSC 231** Aural Skills III 1
- **MUSC 255** Individual Lessons 2
- Essential Studies Social Science 3

**Credits** 16

**Spring**
- **MUSC 235** Aural Skills IV 1
- **MUSC 234** Music Theory IV: Music Theory since 1900 3
- **MUSC 254** Individual Lessons 1
- **MUSC 278** Seminar for Collaborative Piano 1
- Electives 2
- **MUSC 203** Music and Culture 3
- **MUSC 255** Individual Lessons 2
- Essential Studies Social Science 3

**Credits** 16

**Junior Year**

**Fall**
- **MUSC 277** Chamber Music Groups 1
- Essential Studies Social Science (U) 3
- **MUSC 355** Individual Lessons 4
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 310** Music History Survey I 3
- Music Elective 3

**Credits** 15

**Spring**
- **MUSC 278** Seminar for Collaborative Piano 1
- **MUSC 255** Individual Lessons 2
- **MUSC 490** Seminar in Music 3
- **MUSC 414** Piano Literature 3

**Credits** 15

---

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
<table>
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<tr>
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<td>MUSC 311</td>
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<td>MUSC 359</td>
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<td>MUSC 414</td>
<td>Piano Literature</td>
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<td>MUSC 310</td>
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<td>Chamber Music Groups</td>
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<tr>
<td>Essential Studies Math/Science/Technology</td>
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<td>3</td>
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<tr>
<td>MUSC 455</td>
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<td>MUSC 277</td>
<td>Chamber Music Groups</td>
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</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
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<tr>
<td>MUSC 359</td>
<td>Junior Recital</td>
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<tr>
<td>MUSC 277</td>
<td>Chamber Music Groups</td>
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<tr>
<td>MUSC 255</td>
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<td>Seminar for Collaborative Piano</td>
<td>1</td>
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<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
</tr>
<tr>
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<td>1-2</td>
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<td>MUSC 278</td>
<td>Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 255</td>
<td>Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 278</td>
<td>Seminar for Collaborative Piano</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</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
### International Studies

#### B.A. in International Studies

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>GEOG 161 World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Fall</td>
<td>ANTH 171 Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 102 Western Civilization II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>POLS 220 International Politics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 225 Comparative Politics</td>
<td>3</td>
</tr>
<tr>
<td>RELS 203 World Religions</td>
<td>3</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>HIST 362 Modern China</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 21

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 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 is needed to graduate.

**Languages**

#### B.A. in Language: Chinese Studies

#### B.A. in Language: Classical Studies

#### B.A. in Language: French

#### B.A. in Language: German Studies

#### B.A. in Language: Norwegian

#### B.A. in Language: Spanish

#### B.A. in Language: Chinese Studies

**Freshman Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHIN 101 First Year Chinese I</td>
<td>4</td>
</tr>
<tr>
<td>Fall</td>
<td>CHIN 305 Chinese Culture Through Films</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Essential Studies/Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 102 First Year Chinese II</td>
<td>4</td>
</tr>
<tr>
<td>HIST 362 Modern China</td>
<td>3</td>
</tr>
</tbody>
</table>

**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>
</tbody>
</table>

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIN 201 Second Year Chinese I</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 405 Traditional Chinese Literature in Translation</td>
<td>3</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Essential Studies/Electives</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>LANG 480 Capstone: Global Connections</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
<td>13</td>
</tr>
<tr>
<td>CHIN 202 Second Year Chinese II</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 406 Modern Chinese Literature in Translation</td>
<td>3</td>
</tr>
<tr>
<td>BADM 316 Introduction to Business in China</td>
<td>3</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>LANG 480 Capstone: Global Connections</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

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. in Language: French

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 101</td>
<td>First Year French I</td>
</tr>
<tr>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

#### Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 201</td>
<td>Second Year French I</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 307</td>
<td>A Social and Cultural History of Québec or Advanced French Grammar Review or Seminar in French and Francophone Studies</td>
</tr>
</tbody>
</table>

| Essential Studies/Electives | 10 |

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 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. in Language: German Studies

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERM 101</td>
<td>First Year German I</td>
</tr>
</tbody>
</table>

| Course related to German Studies | 3 |

#### Spring

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 301</td>
<td>Third Year French I or A Social and Cultural History of Québec or Advanced French Grammar Review</td>
</tr>
</tbody>
</table>

| Essential Studies/Electives | 10 |

This is only an example. It is highly recommended that any student interested in a German 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. in Language: German Studies

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERM 101</td>
<td>First Year German I</td>
</tr>
</tbody>
</table>

| Course related to German Studies | 3 |
### B.A. in Language: Norwegian

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>NORW 101 First Year Norwegian I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>Essential Studies/Electives</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>NORW 102 First Year Norwegian II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

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 Norwegian major after their Freshman year. Students must complete all Essential Studies requirements and departmental elective requirements to graduate.

### B.A. in Language: Spanish

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>SPAN 101 First Year Spanish I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Essential Studies/Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>Essential Studies/Electives</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>SPAN 102 First Year Spanish II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

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 students who start the Spanish major after their Freshman year. Students must complete all Essential Studies requirements and departmental elective requirements to graduate.
### 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 SPAN 421 Modern Contemporary Spanish Literature Culture 3
LANG 480 Capstone: Global Connections 3

Credits 15

### Spring
SPAN 422 Early Latin American Literature Culture
or SPAN 423 Modern Contemporary Latin American Literature Culture 3
SPAN 462 Seminar in Hispanic Literature, Culture and Linguistics
or SPAN 450 Advanced Spanish Grammar 3
Essential Studies/Electives 9

Credits 16

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. in Mathematics

#### B.S. in Mathematics with Secondary Education Certification

#### B.S. in Mathematics

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 160 Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 160L Computer Prog I Lab</td>
<td>0</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>general/essential studies elective</td>
<td>6-7</td>
</tr>
</tbody>
</table>

Credits 17-18

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<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>general/essential studies elective(s)</td>
<td>3-6</td>
</tr>
</tbody>
</table>

Credits 16-19

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 208 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 265 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>general/essential studies electives</td>
<td>6-9</td>
</tr>
</tbody>
</table>

Credits 13-16

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 330 Set Theory and Logic</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 125

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](http://und.edu/academics/essential-studies/requirements.cfm)

#### B.S. in Mathematics with Secondary Education Certification

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 160 Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 160L Computer Prog I Lab</td>
<td>0</td>
</tr>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>general/essential studies elective</td>
<td>6-7</td>
</tr>
</tbody>
</table>

Credits 17-18

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 166 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 251 University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>general/essential studies elective</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Credits 16-17

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 208 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 265 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>T&amp;L 250 Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>general/essential studies elective(s)</td>
<td>6</td>
</tr>
</tbody>
</table>

Credits 16

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 330 Set Theory and Logic</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 339 Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 432 Learning Environments</td>
<td>3</td>
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</tbody>
</table>

Total Credits 106-128
general/essential studies elective(s) | 6
---|---
Credits | 17

**Junior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 321</td>
<td>Applied Statistical Methods</td>
</tr>
<tr>
<td>MATH 409</td>
<td>Geometry</td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
</tr>
</tbody>
</table>

**Credits** | 17

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 308</td>
<td>History of Mathematics</td>
</tr>
<tr>
<td>MATH 435</td>
<td>Theory of Numbers</td>
</tr>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
</tr>
<tr>
<td>MATH 399</td>
<td>Methods for Secondary Teachers: Mathematical Content Knowledge</td>
</tr>
</tbody>
</table>

**Credits** | 17

---

**Senior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 400</td>
<td>Methods for Teaching Middle and Secondary Mathematics; Pedagogical Content Knowledge</td>
</tr>
<tr>
<td>MATH 441</td>
<td>Abstract Algebra</td>
</tr>
<tr>
<td>MATH 488</td>
<td>Senior Capstone</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
</tr>
</tbody>
</table>

**Credits** | 15

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
</tr>
<tr>
<td>MUSC 154</td>
<td>Individual Lessons</td>
</tr>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
</tr>
<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
</tr>
</tbody>
</table>

**Credits** | 15

---

**Sophomore Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
</tr>
<tr>
<td>MUSC 230</td>
<td>Music Theory III</td>
</tr>
<tr>
<td>Electives</td>
<td>3</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</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
</tr>
</tbody>
</table>

**Credits** | 15

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Studies Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
</tr>
<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
</tr>
<tr>
<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
</tr>
<tr>
<td>Essential Studies Lab Science</td>
<td>4</td>
</tr>
</tbody>
</table>

**Credits** | 15

---

**Junior Year**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</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</td>
<td>Music History Survey I</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
</tr>
</tbody>
</table>

**Credits** | 16

**Spring**

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**Credits** | 15

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**Senior Year**

**Fall**

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**Credits** | 15

**Spring**

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**Credits** | 15
### B.A. in Music - Concentration Option - Composition Emphasis (Even Fall Entry)

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<td>MUSC 133</td>
<td>Keyboard Skills I KS or Individual Lessons</td>
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<td>MUSC 135</td>
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<td>Fundamentals of Public Speaking</td>
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<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
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### B.A. in Music - Concentration Option - Composition Emphasis (Odd Fall Entry)

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<td>MUSC 154</td>
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### B.A. in Music - Foreign Language Option

#### Freshman Year

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#### Credits | 16

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#### Credits | 16

### Sophomore Year

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#### Credits | 16

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#### Credits | 16

### Junior Year

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#### Credits | 16

### Credits | 125
B.A. in Music - Foreign Language Option - Composition Emphasis (Even Fall Entry)

### Freshman Year

#### Fall

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<td>MUSC 130: Music Theory I</td>
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**Credits:** 15

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### Sophomore Year

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### Junior Year

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**Credits:** 16

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**Credits:** 16

### Senior Year

#### Fall

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**Credits:** 16

**Total Credits:** 125

### B.A. in Music - Foreign Language Option - Composition Emphasis (Odd Fall Entry)

#### Freshman Year

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<tr>
<td>MUSC 130: Music Theory I</td>
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<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
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<tr>
<td>Essential Studies Humanities</td>
<td>3</td>
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<tr>
<td>MUSC 230: Music Theory III</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110: Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 231: Aural Skills III</td>
<td>1</td>
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<tr>
<td>MUSC 254: Individual Lessons</td>
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**Credits:** 15

#### Spring

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Essential Studies Social Science</td>
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<tr>
<td>Essential Studies Lab Science</td>
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<tr>
<td>Electives</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 254: Individual Lessons</td>
<td>1</td>
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<tr>
<td>MUSC 234: Music Theory IV: Music Theory since 1900</td>
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<td>MUSC 235: Aural Skills IV</td>
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**Credits:** 15

#### Junior Year

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</tr>
<tr>
<td>Foreign Language III</td>
<td>4</td>
</tr>
<tr>
<td>MUSC 429: Composition</td>
<td>2</td>
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<tr>
<td>MUSC 427: Analysis of Musical Form</td>
<td>2</td>
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<tr>
<td>Music Electives</td>
<td>2</td>
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<tr>
<td>MUSC 310: Music History Survey I</td>
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**Credits:** 16

#### Spring

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<th>Course</th>
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<tbody>
<tr>
<td>MUSC 311: Music History Survey II</td>
<td>3</td>
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<td>MUSC 430: Composition Lessons</td>
<td>1</td>
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<tr>
<td>MUSC 428: Counterpoint</td>
<td>2</td>
</tr>
<tr>
<td>Foreign Language II</td>
<td>4</td>
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<tr>
<td>Music Electives</td>
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<td>Electives</td>
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**Credits:** 16

#### Senior Year

<table>
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<tbody>
<tr>
<td>Essential Studies Social Science</td>
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<td>Electives</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 230: Music and Culture</td>
<td>3</td>
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<tr>
<td>MUSC 490: Seminar in Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 492: Senior Project</td>
<td>2</td>
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<tr>
<td>MUSC 340: Introduction to Music Technology</td>
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</tr>
<tr>
<td>MUSC 430: Composition Lessons</td>
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**Credits:** 16

**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](http://und.edu/academics/essential-studies/requirements.cfm)
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<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>MUSC 154</td>
<td>Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td>1</td>
</tr>
<tr>
<td>or MUSC 154</td>
<td>or Individual Lessons</td>
<td></td>
</tr>
<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
</tr>
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<td>Major Ensemble</td>
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<td>Essential Studies Math/Science/Technology</td>
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**Credits**: 16

**Sophomore Year**

**Fall**

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<tr>
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<td>Individual Lessons</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
<td>Major Ensemble</td>
<td>1</td>
<td></td>
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<tr>
<td>Essential Studies Humanities (Non-Music)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
<td></td>
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<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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<tr>
<td>MUSC 230</td>
<td>Music Theory III</td>
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**Credits**: 15

**Spring**

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<th>Course Title</th>
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<tbody>
<tr>
<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
<td>3</td>
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<td>MUSC 235</td>
<td>Aural Skills IV</td>
<td>1</td>
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<td>Major Ensemble</td>
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<td></td>
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<tr>
<td>Electives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Essential Studies Lab Science</td>
<td>4</td>
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<td>Essential Studies Social Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
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**Credits**: 16

**Junior Year**

**Fall**

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<tbody>
<tr>
<td>MUSC 423</td>
<td>Instrumental and Choral Arranging</td>
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<tr>
<td>Essential Studies Social Science (U)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language I</td>
<td>4</td>
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<tr>
<td>Music Electives</td>
<td>2</td>
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<tr>
<td>MUSC 429</td>
<td>Composition</td>
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**Credits**: 16

**Spring**

<table>
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<th>Course Title</th>
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<td>MUSC 430</td>
<td>Composition Lessons</td>
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<tr>
<td>MUSC 411</td>
<td>Music History Survey II</td>
<td>3</td>
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<tr>
<td>Music Electives</td>
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<tr>
<td>Foreign Language II</td>
<td>4</td>
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<td>Electives</td>
<td>4</td>
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<tr>
<td>MUSC 340</td>
<td>Introduction to Music Technology</td>
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**Credits**: 16

**Senior Year**

**Fall**

<table>
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<th>Course Title</th>
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<tbody>
<tr>
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<td>Composition Lessons</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Essential Studies Social Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Foreign Language III</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Music Electives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MUSC 427</td>
<td>Analysis of Musical Form</td>
<td>2</td>
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</table>

**Credits**: 16

**Spring**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Foreign Language IV</td>
<td>4</td>
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<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 490</td>
<td>Seminar in Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 492</td>
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<td>2</td>
</tr>
<tr>
<td>MUSC 428</td>
<td>Counterpoint</td>
<td>2</td>
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</tbody>
</table>

**Credits**: 16

**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

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### Music Education

#### B.M. in Music Education - Choral Track (Even Fall Entry)

#### B.M. in Music Education - Choral Track (Odd Fall Entry)

#### B.M. in Music Education - Instrumental Track (Even Fall Entry)

#### B.M. in Music Education - Instrumental Track (Odd Fall Entry)

#### B.M. in Music Education - Choral Track (Even Fall Entry)

**Freshman Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MUSC 130</td>
<td>Music Theory I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 154</td>
<td>Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 133</td>
<td>Keyboard Skills I</td>
<td>1</td>
</tr>
<tr>
<td>or MUSC 154</td>
<td>or Individual Lessons</td>
<td></td>
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<tr>
<td>Essential Studies Lab Science</td>
<td>4</td>
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</tr>
<tr>
<td>MUSC 131</td>
<td>Aural Skills I</td>
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**Credits**: 14

**Spring**

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<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
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<tr>
<td>MUSC 135</td>
<td>Aural Skills II</td>
<td>1</td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 154</td>
<td>Individual Lessons</td>
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<tr>
<td>MUSC 180</td>
<td>Introduction to Music Therapy</td>
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**Credits**: 16

**Sophomore Year**

**Fall**

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<tr>
<td>MUSC 256</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 152</td>
<td>Class Guitar for Music Majors</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 230</td>
<td>Music Theory II</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
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<tr>
<td>MUSC 233</td>
<td>Keyboard Skills II</td>
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<tr>
<td>or MUSC 254</td>
<td>or Individual Lessons</td>
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<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
<td>1</td>
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<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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<td>Major Ensemble</td>
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**Credits**: 16

**Spring**

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<th>Course Title</th>
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<td>3</td>
</tr>
<tr>
<td>MUSC 258</td>
<td>Instrumental Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 254</td>
<td>Individual Lessons</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 234</td>
<td>Music Theory IV: Music Theory since 1900</td>
<td>3</td>
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<tr>
<td>MUSC 235</td>
<td>Aural Skills IV</td>
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B.M. in Music Education - Choral Track (Odd Fall Entry)

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<th>Year</th>
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<tbody>
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<tr>
<td>Fall</td>
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</tr>
<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>MUSC 154</td>
<td>Individual Lessons</td>
<td>1</td>
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<tr>
<td>Major Ensemble</td>
<td>Consult Advisor</td>
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</tr>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies Lab Science</td>
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<thead>
<tr>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
<td>3</td>
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<td>MUSC 135</td>
<td>Aural Skills II</td>
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<tr>
<td>MUSC 136</td>
<td>Keyboard Skills II</td>
<td>1</td>
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<td>MUSC 154</td>
<td>Individual Lessons</td>
<td>1</td>
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<tr>
<td>Major Ensemble</td>
<td>Multicultural Education (Non-Music)</td>
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| Credits      | 14                                                                  |         |

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
<td>MUSC 236</td>
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<td>MUSC 234</td>
<td>or Individual Lessons</td>
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<tr>
<td>MUSC 140</td>
<td>Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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<td>Major Ensemble</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
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<tr>
<td>Spring</td>
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<tr>
<td>MUSC 231</td>
<td>Aural Skills III</td>
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<td>MUSC 140</td>
<td>Methods: Woodwinds, Brass, Strings, Percussion, Voice</td>
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| Credits      | 16                                                                  |         |

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<th>Junior Year</th>
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<td>Senior Seminar</td>
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| Credits      | 17                                                                  |         |

**Total Credits**: 133-134

KS = Keyboard Skills or Piano Lessons - See Advisor.

1 = Voice.

2 = Course only required for Optional Instrumental 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
B.M. in Music Education - Instrumental Track
(Even Fall Entry)

Freshman Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MUSC 130</td>
<td>3</td>
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<tr>
<td>MUSC 131</td>
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<td>MUSC 140</td>
<td>1</td>
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<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
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<tr>
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<table>
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<tr>
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Spring

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Sophomore Year

Fall

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<tbody>
<tr>
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<td>MUSC 140</td>
<td>1</td>
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<tr>
<td>Major Choral Ensemble</td>
<td>1</td>
</tr>
<tr>
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Spring

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Junior Year

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Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.cfm

KS = Keyboard Skills or Piano Lessons.
1 = On Voice.
2 = Course Required only for Optional Instrumental Licensure. **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. in Music Education - Instrumental Track

#### Odd Fall Entry

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### Music Therapy

#### B.M. in Music Therapy (Even Fall Entry)

#### B.M. in Music Therapy (Odd Fall Entry)

#### B.M. in Music Therapy (Even Fall Entry)

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**Senior Year**

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**Summer**

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**Professional Year 1**

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**Total Credits**

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KS = Keyboard Skills or Piano Lessons.

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
B.M. in Music Therapy (Odd Fall Entry)

**Freshman Year**

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| **Fall** |         | MUSC 130    | Music Theory I | 3
|          |         | MUSC 154    | Individual Lessons | 1
|          |         | MUSC 150    | Class Lessons (Voice) | 1
|          |         | MUSC 131    | Aural Skills I | 1
|          |         | ENGL 110    | College Composition I | 3
|          |         | PSYC 111    | Introduction to Psychology | 3
| Major Ensemble | 1 | Consult Advisor |
| MUSC 133 or MUSC 154 |         | Keyboard Skills I or Individual Lessons | 1
| MUSC 152 |         | Class Guitar for Music Majors | 1

**Spring**

| Credits | 15 |

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| MUSC 154    | Individual Lessons | 1
| MUSC 252    | Class Guitar for Music Majors | 1
| MUSC 180    | Introduction to Music Therapy | 3
| Major Ensemble | 1 |
| MUSC 136 or MUSC 154 | Keyboard Skills II or Individual Lessons | 1
| Essential Studies Math/Science/Technology | 3 |
| MUSC 151    | Class Lessons (Voice) | 1
| MUSC 134    | Music Theory II | 3
| MUSC 135    | Aural Skills II | 1

**Sophomore Year**

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| **Fall** |         | MUSC 254    | Individual Lessons | 1
|          |         | MUSC 280    | Music Therapy Clinical Skills | 3
|          |         | T&L 315     | Education of Exceptional Students | 3
|          |         | MUSC 256    | Basic Conducting | 2
|          |         | MUSC 233 or MUSC 254 | Keyboard Skills III or Individual Lessons | 1
|          |         | MUSC 282    | Music Therapy Practicum I | 1
|          |         | MUSC 231    | Aural Skills III | 1
| Major Ensemble | 1 |
| MUSC 230 |         | Music Theory III | 3

**Spring**

| Credits | 16 |

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| Major Ensemble | 1 |
| MUSC 234    | Music Theory IV: Music Theory since 1900 | 3
| MUSC 235    | Aural Skills IV | 1
| MUSC 254    | Individual Lessons | 1
| MUSC 236 or MUSC 254 | Keyboard Skills IV or Individual Lessons | 1
| MUSC 203    | Music and Culture | 3
| MUSC 281    | Music Therapy Techniques I | 2
| MUSC 382    | Music Therapy Practicum II | 1

**Junior Year**

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| **Fall** |         | MUSC 383    | Music Therapy Practicum III | 1
|          |         | MUSC 423    | Instrumental and Choral Arranging | 2
| Major Ensemble | 1 |
| MUSC 310 |         | Music History Survey I | 3

**Senior Year**

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| **Summer** |         | MUSC 397 | Cooperative Education in Music | 1

**Spring**

| Credits | 17 |

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| MUSC 454    | Individual Lessons | 1
| MUSC 490    | Seminar in Music | 3
| MUSC 480    | Psychological Foundations of Music Learning | 3
| MUSC 340    | Introduction to Music Therapy | 2
| ENGL 130    | Composition II: Writing for Public Audiences | 3
| PSYC 270    | Abnormal Psychology | 3

**Professional Year 1**

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| **Fall** |         | MUSC 397 or MUSC 497 | Cooperative Education in Music or Music Therapy Internship | 2

**Spring**

| Credits | 15 |

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| MUSC 354 | Individual Lessons | 1
| PSYC 250 | Developmental Psychology | 4
| AMTA Electives | 2 |
| MUSC 381 | Music Therapy Techniques II | 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

Musical Theatre

B.F.A. in Musical Theatre with a Major in Theatre Arts

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| **First Semester** |         | MUSC 130    | Music Theory I | 3
|          |         | MUSC 131    | Aural Skills I | 1
|          |         | MUSC 155    | Individual Lessons | 2
|          |         | THEA 161    | Acting I | 3

---

1 = On Primary Instrument.  
KS = Keyboard Skills or Piano Lessons.  
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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.
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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

### Philosophy and Religion

**B.A. in Philosophy and Religion: Philosophy Concentration**

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### B.A. in Philosophy and Religion: Pre-Law Concentration

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## B.A. in Philosophy and Religion: Pre-Law Concentration

### Freshman Year

**Fall**
- ENGL 110 College Composition I 3
- PHIL 101 Introduction to Philosophy 3
- Electives/Essential Studies 10

**Credits** 16

### Second Semester

**Electives/Essential Studies** 12

**PHIL 480** Public Philosophy 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.

**Credits** 3

**Total Credits** 127

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<td>or PHIL 301</td>
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<td>or PHIL 302</td>
<td>or Renaissance and Enlightenment</td>
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<tr>
<td>or PHIL 303</td>
<td>or Kant and the Nineteenth Century</td>
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### Sophomore Year

**Fall**
- Electives/Essential Studies 12
- PHIL 120 Introduction to Ethics 3
- PHIL 460 Philosophy of Law 3

**Credits** 18

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### Junior Year

**Fall**
- Electives/Essential Studies 12
- PHIL 251 Ethics in Health Care 3
- PHIL 252 Ethics in Business and Public Administration 3
- PHIL 253 Environmental Ethics 3
- PHIL 342 Ethical Theory 3
- PHIL 425 or Public Philosophy 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.

**Credits** 18

### Senior Year

**Fall**
- PHIL or RELS Elective 3
- Elective/Essential Studies 12
- PHIL 130 Introduction to Political Philosophy 3
- PHIL 312 or American Philosophy 3
- PHIL 355 or Social and Political Philosophy 3
- PHIL 360 or Feminist Philosophy 3
- PHIL 450 or Philosophy, Economics, and Politics 3
- PHIL 451 or Citizenship and Political Participation 3

**Credits** 15

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**Total Credits** 127

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### B.A. in Philosophy and Religion: Religion Concentration

#### Freshman Year

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#### Sophomore Year

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#### Senior Year

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### Physics

#### B.S. in Physics - four years, even year freshman enrollment (p. 293)

#### B.S. in Physics - four years, odd year freshman enrollment (p. 294)

#### B.S. in Physics - four years, even year freshman enrollment

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<tr>
<td></td>
<td>PHYS 101</td>
<td>Survey of Physics &amp; Astrophysics</td>
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<td>Introductory Astronomy</td>
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<td></td>
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<td>General Chemistry I Laboratory</td>
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<td></td>
<td>MATH 165</td>
<td>Calculus I</td>
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<td></td>
<td>CHEM 121</td>
<td>General Chemistry I</td>
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<td>General Chemistry II Laboratory</td>
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<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
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<tr>
<td>MATH 166</td>
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<tr>
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<td>MATH 265</td>
<td>Calculus III</td>
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<td>MATH 207</td>
<td>Introduction to Linear Algebra</td>
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<td></td>
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B.S. in Physics - four years, odd year freshman enrollment

**Freshman Year**

**Fall**

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<td>CHEM 121</td>
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**Spring**

<table>
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<td>Physics Elective</td>
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<td>PHYS 324</td>
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**Total Credits**

**16**

**Sophomore Year**

**Fall**

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<thead>
<tr>
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<tbody>
<tr>
<td>MATH 207</td>
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**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 266</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 253</td>
<td>4</td>
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<td>Essential Studies</td>
<td>3</td>
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<tr>
<td>Essential Studies</td>
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<td>Elective</td>
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**Junior Year**

**Fall**

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<tr>
<td>PHYS 428</td>
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<td>PHYS 317</td>
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<td>PHYS 327</td>
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<tr>
<td>Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Physics Elective</td>
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<td>Elective</td>
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**Spring**

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MATH 352</td>
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<td>PHYS 325</td>
<td>3</td>
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<tr>
<td>Essential Studies</td>
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<td>Elective</td>
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**Senior Year**

**Fall**

<table>
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<th>Course</th>
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<tr>
<td>PHYS 431</td>
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<tr>
<td>PHYS 415</td>
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<tr>
<td>Physics Elective</td>
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<tr>
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**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 325</td>
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<td>Elective</td>
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**Total Credits**

**125**

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
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<td>FREN 101</td>
<td>First Year French I</td>
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<tr>
<td>or SPAN 101</td>
<td>or First Year Spanish I</td>
<td></td>
</tr>
<tr>
<td>or GERM 101</td>
<td>or First Year German I</td>
<td></td>
</tr>
<tr>
<td>or NORW 101</td>
<td>or First Year Norwegian I</td>
<td></td>
</tr>
<tr>
<td>or CHIN 101</td>
<td>or First Year Chinese I</td>
<td></td>
</tr>
<tr>
<td>or RUSS 101</td>
<td>or First Year Russian I</td>
<td></td>
</tr>
<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology (ES course &amp; Major requirement)</td>
<td>3</td>
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<tr>
<td>Elective Course or Course in Minor</td>
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<td>3</td>
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<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
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<tr>
<td><strong>Second Semester</strong></td>
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<td></td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences (ES Course &amp; Major requirement)</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking (ES Course &amp; Major requirement)</td>
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<tr>
<td>FREN 102</td>
<td>First Year French II</td>
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<tr>
<td>or SPAN 102</td>
<td>or First Year Spanish II</td>
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<tr>
<td>or GERM 102</td>
<td>or First Year German II</td>
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<tr>
<td>or NORW 102</td>
<td>or First Year Norwegian II</td>
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<td>or CHIN 102</td>
<td>or First Year Chinese II</td>
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<td>or RUSS 102</td>
<td>or First Year Russian II</td>
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<td><strong>First Semester</strong></td>
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<tr>
<td>BIOL 111</td>
<td>Concepts of Biology</td>
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<td>Concepts of Biology Laboratory</td>
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<td>Introduction to Statistics (ES Course &amp; Major requirement)</td>
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<td>PSYC 303</td>
<td>Research Methods in Psychology (Major requirement)</td>
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<td>PSYC elective</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
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<tr>
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<td>BIOL 151</td>
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<td>or Anatomy for Paramedical Personnel</td>
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<td>BIOL 151L</td>
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<td>Abnormal Psychology (ES course &amp; Major elective)</td>
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<td>PSYC 304</td>
<td>Advanced Research Methods (Major requirement for BS only)</td>
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<tr>
<td>PSYC 320</td>
<td>Professional Development &amp; Ethics (Major requirement)</td>
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<td>Fine Arts (ES requirement)</td>
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<td>or Psychological Helping Skills</td>
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<td>or PSYC 493</td>
<td>or Instructional Experiences in Psychology</td>
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<tr>
<td>or PSYC 494</td>
<td>or Advanced Individual Research</td>
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<td>History and Systems of Psychology (ES capstone &amp; Major requirement)</td>
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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](http://und.edu/academics/essential-studies/requirements.cfm)

### Sociology

#### B. A. in Sociology

**Freshman Year**

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<tr>
<th>First Semester</th>
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<tr>
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<td>College Composition I</td>
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<td>Elective</td>
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<tr>
<td>Essential Studies: Global Diversity</td>
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<td><strong>Credits</strong></td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<td>Essential Studies: Oral Communication</td>
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<tr>
<td>SOC 250</td>
<td>Diversity in American Society</td>
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<tr>
<td>Credits in selected minor</td>
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<td>Elective</td>
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**Sophomore Year**

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<tr>
<td>SOC 301</td>
<td>Basic Sociological Theory</td>
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<td>Sociological Research Methods</td>
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<td>Fine Arts or Humanities</td>
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<tr>
<td><strong>Credits</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
</tr>
<tr>
<td>Essential Studies: Math/Sci/Tech</td>
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</tr>
<tr>
<td>SOC 326</td>
<td>Sociological Statistics</td>
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<tr>
<td>SOC 352</td>
<td>Aging</td>
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<td>Essential Studies: Fine Arts or Humanities</td>
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<tr>
<td>Credits in selected minor</td>
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**Junior Year**

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<tr>
<td>SOC 306</td>
<td>Social Change</td>
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<td>Credits in selected minor</td>
<td>3</td>
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<tr>
<td>Fine Arts or Humanities</td>
<td>3</td>
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</table>
Social Science (Non Sociology) 3
Elective 3

**Second Semester**
SOC 431 Organizations and Behavior 2 3
Credits in selected minor 3
SOC 361 Social Psychology 3
Elective 3

**Credits** 15

---

**Senior Year**

**First Semester**
Credits in selected minor 3
Elective 9

**Second Semester**
SOC 436 Social Inequality 2 3
SOC 475 Sociology Capstone 3
Elective 9

**Credits** 15

---

**Total Credits** 125

1 = Or any Sociology elective. 2 = Or any 400 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

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**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
Language 4

**Credits** 14

**Second Semester**
Social Science (U) 3
Language 4
THEA 260 Costume Craft 3
THEA 110 Introduction to Theatre Arts 3
ENGL 130 Composition II: Writing for Public Audiences 3

**Credits** 16

**Second Year**

**First Semester**
Math/Sc/Tech 3
THEA Elective 3
THEA Elective 3
THEA 201 Theatre Practicum 1
COMM 110 Fundamentals of Public Speaking 3
THEA 230 Text Analysis 3

**Credits** 16

**Second Semester**
Social Science 3
Cognate 3
THEA Elective 3

**Credits** 16

---

**Third Year**

**First Semester**
Elective 3
THEA Elective 3
Math/Sc/Tech with Lab 4
Social Science 4
THEA 300 or 335 Directing I or Stage Mgmt 3

**Credits** 17

**Second Semester**
Elective 3
Cognate 3
Humanities 3
THEA Elective 3
THEA Elective 3

**Credits** 15

---

**Fourth Year**

**First Semester**
THEA Elective 3
Elective 3
THEA Elective 3
THEA 330 Contemporary Theatre 3
THEA 423 History of the Theatre: Classical, Medieval and Renaissance 3

**Credits** 15

**Second Semester**
THEA Elective 3
Elective 3
THEA Elective 3
THEA 424 History of the Theatre: Seventeenth Century to the Present 3
THEA 494 Senior Project 4

**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

---

**Visual Arts**

**B.A. in Visual Arts**

**B.A. in Visual Arts - Ceramics Emphasis**

**B.A. in Visual Arts - Jewelry & Metalsmithing Emphasis**

**B.A. in Visual Arts - Painting Emphasis**

**B.A. in Visual Arts - Drawing Emphasis**

**B.A. in Visual Arts - Fibers**

**B.A. in Visual Arts - Photography Emphasis**

**B.A. in Visual Arts - Printmaking Emphasis**

**B.A. in Visual Arts - Sculpture Emphasis**

**B.A. in Visual Arts - Time-based Media Emphasis**
## B.A. in Visual Arts

**Freshman Year**

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## B.F.A. in Visual Arts - Ceramics Emphasis

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| Total Credits                                | 15      |

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**B.F.A in Visual Arts - Jewelry & Metalsmithing Emphasis**

**Freshman Year**

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**Credits**

| 15      |

**Spring**

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**Credits**

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**Sophomore Year**

**Fall**

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**Junior Year**

**Fall**

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**Credits**

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**Credits**

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**B.F.A. in Visual Art - Painting Emphasis**

**Freshman Year**

**Fall**

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**Sophomore Year**

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### B.F.A. in Visual Arts - Drawing Emphasis

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### B.F.A. in Visual Arts - Fibers

**Freshman Year**

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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](http://und.edu/academics/essential-studies/requirements.cfm)
### B.F.A. in Visual Arts - Photography Emphasis

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>ART 112 Basic Design</td>
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<tr>
<td>ART 210 History of Art I</td>
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<tr>
<td>ART 130 Drawing I</td>
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#### Sophomore Year

<table>
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<td>ART 212 Concepts of Art</td>
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<td>ART 277 Fibres I</td>
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<tr>
<td>ART 273 Graphic Design Foundations</td>
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<td>ART 371 Fibres II</td>
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#### Junior Year

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<td>ART 367 Intermediate Photography</td>
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<tr>
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<td>ART 273 Graphic Design Foundations</td>
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<td>ART 494 Professional Exhibition</td>
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#### Senior Year

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<td>ART 405 Advanced Photography</td>
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<td>ART 494 Professional Exhibition</td>
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<tr>
<td>ART 406 Advanced Fibers</td>
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<tr>
<td>ART 498 Seminar in Art and Design Capstone</td>
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<table>
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<tbody>
<tr>
<td>ART 490 Special Projects/ Independent Research (Photography)</td>
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<tr>
<td>ART 400 Level Studio Art or Art History</td>
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<tr>
<td>Elective</td>
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<td>Credits</td>
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Total Credits 125
ART 405 Advanced Photography  
**Credits**  
**Spring**  
ART 498 Seminar in Art and Design Capstone  3  
300-400 Level Studio Art or Art History  3  
300-400 Level Studio Art or Art History  3  
Elective  3  
BFA Art Exhibition  
ART 405 Advanced Photography  3  
**Total Credits**  15

**B.F.A. 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 211 History of Art II  3  
ART 230 Drawing II  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 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  
BFA Application  
**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  2  
**Annual BFA Review**  
**Credits**  15

**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 (Printmaking)  3  
ART 403 Advanced Printmaking  3  
**Credits**  15

**Total Credits**  125

**B.F.A. 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**  
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**  
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  
BFA Application  
**Credits**  15

**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 (Printmaking)  3  
ART 403 Advanced Printmaking  3  
**Credits**  15

**Total Credits**  125

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B.F.A. in Visual Arts - Time-based Media 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

**Spring**
- Essential Studies Elective 3
- ART 114 Visual Persuasion 3
- ART 211 History of Art II 3
- ART 230 Drawing II 3

**Total Credits** 15

**Sophomore Year**

**Fall**
- 200 Level 2D Studio Art Course 3

**Total Credits** 15

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Visual Arts

**B.A. in Visual Arts**

**Freshman Year**

**Fall**
- ART 112 Basic Design 3
- ART 130 Drawing I 3
- Essential Studies Elective 3

**Spring**
- Essential Studies Elective 3
- ART 114 Visual Persuasion 3
- ART 211 History of Art II 3
- ART 230 Drawing II 3

**Total Credits** 15

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Essential Studies Elective 3
Essential Studies Elective 3

Credits 15

Spring
200 Level 2D Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 114 Visual Persuasion 3

Credits 15

Sophomore Year
Fall
200 Level 3D Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
Essential Studies Elective 3
ART 210 History of Art I 3

Credits 18

Spring
200 Level Studio Art Course 3
Essential Studies Elective 3
Essential Studies Elective 3
Elective 3
ART 211 History of Art II 3

Credits 15

Junior Year
Fall
400 Level Art History 3
300-400 Level Studio Art or Art History 3
Elective 3
Elective 3
Elective 3

Credits 17

Spring
300-400 Level Studio Art Course 3
Elective 3
Elective 3
Elective 3
Elective 3
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
Elective 3
300-400 Level Studio Art or Art History 3

Credits 17

Spring
Elective 3
Elective 3
Elective 3
ART 498 Seminar in Art and Design Capstone 3

Credits 15

Total Credits 125

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Vocal Performance

B.M. in Vocal Performance (Even Fall Entry)

B.M. in Vocal Performance (Odd Fall Entry)

B.M. in Vocal Performance (Even Fall Entry)

Freshman Year
Fall
MUSC 130 Music Theory I 3
MUSC 133 or MUSC 154 Keyboard Skills I
or Individual Lessons
MUSC 131 Aural Skills I 1
ENGL 110 College Composition I 3
Essential Studies Lab Science 4
Major Ensemble Consult Advisor 1
MUSC 155 Individual Lessons 1 2

Credits 15

Spring
Electives 3
MUSC 135 Aural Skills II 1
Essential Studies Social Science 3
Major Ensemble 1
MUSC 155 Individual Lessons 2
MUSC 136 Keyboard Skills II 1
or MUSC 154 or Individual Lessons
ENGL 130 Composition II: Writing for Public Audiences 3
MUSC 134 Music Theory II 3

Credits 17

Sophomore Year
Fall
MUSC 233 or MUSC 254 Keyboard Skills III
or Individual Lessons
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 Keyboard Skills IV 1
or MUSC 254 or Individual Lessons

Credits 17

Junior Year
Fall
Chamber Ensemble 1
Music Electives 3
Major Ensemble 1

Credits 15

University of North Dakota
303
### Vocal Performance

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<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<td>Essential Studies Social Science (U)</td>
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<tr>
<td>MUSC 355</td>
<td>Individual Lessons</td>
<td>4</td>
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<tr>
<td>MUSC 310</td>
<td>Music History Survey I</td>
<td>3</td>
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<td>MUSC 444</td>
<td>Applied Music Pedagogy</td>
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**Credits:** 17

### Spring

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<td>MUSC 359</td>
<td>Junior Recital</td>
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<tr>
<td>Music Electives</td>
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<tr>
<td>MUSC 311</td>
<td>Music History Survey II</td>
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<tr>
<td>MUSC 269</td>
<td>Opera Workshop</td>
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**Credits:** 17

### Senior Year

#### Fall

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<tr>
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<tr>
<td>MUSC 455</td>
<td>Individual Lessons</td>
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<td>MUSC 242</td>
<td>Diction for Singers (English/French)</td>
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<td>MUSC 415</td>
<td>Vocal Literature</td>
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<td>Diction for Singers (Italian/German)</td>
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<td>MUSC 455</td>
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<td>MUSC 269</td>
<td>Opera Workshop</td>
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<td>MUSC 490</td>
<td>Seminar in Music</td>
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<td>Senior Recital</td>
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**Credits:** 13-14

**Total Credits:** 125-126

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1 = On Voice.
KS = Keyboard Skills or Piano Lessons.

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### B.M. in Vocal Performance (Odd Fall Entry)

#### Freshman Year

#### Fall

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<td>MUSC 131</td>
<td>Aural Skills I</td>
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<td>Essential Studies Lab Science</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<td>MUSC 130</td>
<td>Music Theory I</td>
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<td>MUSC 133</td>
<td>Keyboard Skills I</td>
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**Credits:** 15

#### Spring

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<td>MUSC 135</td>
<td>Aural Skills II</td>
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<tr>
<td>MUSC 134</td>
<td>Music Theory II</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<td>Major Ensemble</td>
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**Credits:** 14

### Sophomore Year

#### Fall

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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>Major Ensemble</td>
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<td>MUSC 256</td>
<td>Basic Conducting</td>
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<td>MUSC 255</td>
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<td>MUSC 231</td>
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<td>MUSC 230</td>
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<td>MUSC 253</td>
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<td>or MUSC 254</td>
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**Credits:** 17

#### Spring

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<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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<tr>
<td>MUSC 255</td>
<td>Individual Lessons</td>
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<tr>
<td>MUSC 203</td>
<td>Music and Culture</td>
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<tr>
<td>FREN 102</td>
<td>First Year French II</td>
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<tr>
<td>or GERM 102</td>
<td>or First Year German II</td>
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**Credits:** 15

### Junior Year

#### Fall

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<td>Vocal Literature</td>
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<td>MUSC 242</td>
<td>Diction for Singers (English/French)</td>
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<tr>
<td>Chamber Ensemble</td>
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<tr>
<td>Major Ensemble</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>Essential Studies Social Science (U)</td>
<td>3</td>
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</tr>
<tr>
<td>MUSC 355</td>
<td>Individual Lessons</td>
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**Credits:** 15

#### Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Essential Studies Math/Science/Technology (Q)</td>
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<tr>
<td>MUSC 359</td>
<td>Junior Recital</td>
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<tr>
<td>MUSC 311</td>
<td>Music History Survey II</td>
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<tr>
<td>MUSC 269</td>
<td>Opera Workshop</td>
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<tr>
<td>Major Ensemble</td>
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<tr>
<td>Electives</td>
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<tr>
<td>MUSC 242</td>
<td>Diction for Singers (Italian/German)</td>
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**Credits:** 17

### Senior Year

#### Fall

<table>
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<th>Course Code</th>
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<td>Essential Studies Math/Science/Technology (Q)</td>
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<tr>
<td>Chamber Ensemble</td>
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<tr>
<td>Essential Studies Social Science</td>
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<td>Music Electives</td>
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<tr>
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<td>MUSC 455</td>
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<tr>
<td>MUSC 444</td>
<td>Applied Music Pedagogy</td>
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**Credits:** 17

#### Spring

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<th>Course Code</th>
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<tr>
<td>Electives</td>
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<tr>
<td>Major Ensemble</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Music Electives</td>
<td>3</td>
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</tr>
<tr>
<td>MUSC 455</td>
<td>Individual Lessons</td>
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</tbody>
</table>
### College of Business and Public Administration

**B.ACC in Accountancy (p. 305)**

**B.A. in Airport Management (p. 306)**

**B.A. in Aviation Management (p. 307)**

**B.A. in Banking & Financial Economics (p. 308)**

**B.A. in Business Economics (p. 308)**

**B.A. in Entrepreneurship (p. 310)**

**B.S. in Graphic Design Technology (p. 310)**

**B.A. in Human Resource Management (p. 311)**

**B.S in Industrial Technology (p. 312)**

**B.A. in Information Systems (p. 312)**

**B.A. in Investments (p. 313)**

**B.A. in Management (p. 313)**

**B.A. in Managerial Finance & Accounting (p. 314)**

**B.A. in Marketing (p. 315)**

**B.A. in Operations and Supply Chain Management (p. 316)**

**B.A. in Political Science (p. 317)**

**B.S. in Public Administration (p. 317)**

### Accountancy

**B.ACC in Accountancy (CPA Track) (p. 305)**

**B.ACC in Accountancy (Non-CPA track)**

### B.ACC in Accountancy (CPA Track)

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115 American Government I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111 or SOC 110 or ANTH 171 Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies/Fine Arts</td>
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**Credits** 15

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146 Applied Calculus I</td>
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#### Sophomore Year

**Fall**

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>Essential Studies:Humanities</td>
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<tr>
<td>Essential Studies:Lab Science</td>
</tr>
<tr>
<td>ACCT 200 Elements of Accounting I</td>
</tr>
<tr>
<td>ECON 201 Principles of Microeconomics</td>
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<td>ISBC 117 Personal Productivity with Information Technology</td>
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**Open Elective** 3

**Spring**

<table>
<thead>
<tr>
<th>Essentials/Emphasis:Global Diversity</th>
<th>Credits</th>
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<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 201 Elements of Accounting II</td>
</tr>
<tr>
<td>ACCT 218 Advanced Spreadsheet Applications</td>
</tr>
<tr>
<td>ECON 202 Principles of Macroeconomics</td>
</tr>
<tr>
<td>ECON 210 Introduction to Business and Economic Statistics</td>
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**Open Elective** 1

#### Junior Year

**Fall**

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<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 301 Intermediate Accounting I</td>
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<tr>
<td>ACCT 320 Cost Accounting</td>
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<tr>
<td>MGMT 300 Principles of Management</td>
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<tr>
<td>ISBC 317</td>
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<td>MRKT 305 Marketing Foundations</td>
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**Credits** 13

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<th>Spring</th>
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<tbody>
<tr>
<td>ACCT 397 Cooperative Education</td>
<td>7</td>
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</table>

**Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits)**

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACCT 302 Intermediate Accounting II</td>
</tr>
<tr>
<td>ACCT 309 Accounting Information Systems</td>
</tr>
<tr>
<td>ACCT 315 Business Law I</td>
</tr>
<tr>
<td>FIN 310 Principles of Financial Management</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Accountancy Elective (if you plan on taking the CPA exam it is recommended that you take Acct 312, Acct 406, &amp; Acct 410. However, you only need to take two of these classes to graduate with a BACC degree)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MGMT 301 Operations Management</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 301 Operations Management</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 405 Assurance Services</td>
</tr>
<tr>
<td>ECON 303 Money and Banking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting Elective (if you plan on taking the CPA exam it is recommended that you take Acct 312, Acct 406, &amp; Acct 410. However, you only need to take two of these classes to graduate with a BACC degree)</td>
</tr>
</tbody>
</table>

*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*
Fifth Year

Fall
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)

Credits 18

Spring
Second degree course or open elective (to earn a BACC degree and a BBA degree you need at least 156 credits)
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)

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).

^^ 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.ACC in Accountancy (Non-CPA track)

Freshman Year

Fall Credits
ENGL 110 College Composition I 3
MATH 103 College Algebra 3
POL 115 American Government I 3
PSYC 111 Introduction to Psychology 3
or SOC 110 or Introduction to Sociology 3
or ANTH 171 or Introduction to Cultural Anthropology 3
Essential Studies: Fine Arts 3

Credits 15

Spring
Essential Studies/Special Emphasis: Global Diversity 3
Essential Studies: Arts or Humanities 3
COMM 110 Fundamentals of Public Speaking 3
MATH 146 Applied Calculus I 3
ENGL 130 Composition II: Writing for Public Audiences 3

Credits 15

Sophomore Year

Fall
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
Open elective 1
Essential Studies: Humanities 3

Credits 17

Spring
Essential Studies/Special Emphasis: United States Diversity 3
Open Elective 1

Credits 1

Junior Year

Fall
Open Elective 1
ACCT 301 Intermediate Accounting I 3
ACCT 320 Cost Accounting 3
MGMT 300 Principles of Management 3
ISBC 317 3
MRKT 305 Marketing Foundations 3

Credits 16

Spring
Open Elective 1
ACCT 302 Intermediate Accounting II 3
ACCT 309 Accounting Information Systems 3
ACCT 315 Business Law I 3
MGMT 301 Operations Management 3
FIN 310 Principles of Financial Management 3

Credits 16

Senior Year

Fall
Accounting Elective 2 3
Open Elective 1
ACCT 401 Advanced Accounting 3
ACCT 405 Assurance Services 3
ACCT 316 Business Law II 3
ECON 303 Money and Banking 3

Credits 15

Total Credits 126

COMMENT: THE FOUR YEAR PROGRAM ALLOWS A STUDENT TO GRADUATE WITH 126 CREDITS BUT DOES NOT ALLOW THE STUDENT TO SIT FOR THE CPA EXAM!!

1. You must complete enough open electives to bring total credit hours up to 126.
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

B.B.A. in Airport Management

Freshman Year

Fall Credits
ENGL 110 College Composition I 3

Credits 3

Airport Management

B.B.A. in Airport Management

Freshman Year

Fall Credits
ENGL 110 College Composition I 3

Credits 3
MATH 103  College Algebra  3
POLS 115  American Government I  3
ATSC 110  Meteorology I  3
ATSC 110L  Meteorology I Laboratory  1
AVIT 100  Aviation Orientation  1
PSYC 111  Introduction to Psychology  3
  or SOC 110  or Introduction to Sociology  1
  or ANTH 117  or Introduction to Cultural Anthropology  1

Credits  17

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
AVIT 208  Aviation Safety  3
ECON 201  Principles of Microeconomics  3
ACCT 200  Elements of Accounting I  3
COMM 110  Fundamentals of Public Speaking  3
ISBC 117  Personal Productivity with Information Technology  1

Essential Studies: US Diversity  3

Credits  16

Spring
ISBC 217  Fundamentals of Computer Information Systems  3
ECON 202  Principles of Macroeconomics  3
ACCT 201  Elements of Accounting II  3
ECON 210  Introduction to Business and Economic Statistics  3

Essential Studies: Arts or Humanities (FA or HUM)  3

Credits  15

Junior Year
Fall
MRKT 305  Marketing Foundations  3
AVIT 250  Human Factors  2
ISBC 305  End-User Applications  3
MGMT 300  Principles of Management  3
MGMT 301  Operations Management  3

Elective  4

Credits  16

Spring
MGMT 302  Human Resource Management  3
FIN 310  Principles of Financial Management  3
AVIT 311  Safety Management System (SMS)  3
AVIT 405  or AVIT 407  or General Aviation Operations and Management  3

Essential Studies: Global Diversity  3

Credits  15

Senior Year
Fall
AVIT 403  Aerospace Law  3
AVIT 402  Airport Planning and Administration  3
ACCT 315  Business Law I  3
ECON 303  Money and Banking  3
MGMT 310  Organizational Behavior  3

Credits  15

Spring
MGMT 475  Strategic Management  3
AVIT 442  Airport Operations and Administration  3
AVIT 485  Aviation Senior Capstone  3

GEOL 103  Introduction to Environmental Issues  3
POLS 308  Intergovernmental Relations  3
  or POLS 404  or POLS 432  3

Credits  17

Total Credits  125

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](http://und.edu/academics/essential-studies/requirements.cfm)

### Aviation Management

#### B.B.A. in Aviation Management

**Freshman Year**

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<tbody>
<tr>
<td>ENGL 110  College Composition I  3</td>
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<tr>
<td>MATH 103  College Algebra  3</td>
</tr>
<tr>
<td>AVIT 102  Introduction to Aviation  5</td>
</tr>
<tr>
<td>ATSC 110  Meteorology I  3</td>
</tr>
<tr>
<td>ATSC 110L  Meteorology I Laboratory  1</td>
</tr>
<tr>
<td>AVIT 100  Aviation Orientation  1</td>
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**Credits  16**

<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>ENGL 130  Composition II: Writing for Public Audiences  3</td>
</tr>
<tr>
<td>MATH 146  Applied Calculus I  3</td>
</tr>
<tr>
<td>POLS 115  American Government I  3</td>
</tr>
<tr>
<td>AVIT 208  Aviation Safety  3</td>
</tr>
<tr>
<td>AVIT 221  Basic Attitude Instrument Flying  3</td>
</tr>
<tr>
<td>AVIT 103  Introduction to Air Traffic Control  2</td>
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**Credits  17**

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>ECON 201  Principles of Microeconomics  3</td>
</tr>
<tr>
<td>ACCT 200  Elements of Accounting I  3</td>
</tr>
<tr>
<td>COMM 110  Fundamentals of Public Speaking  3</td>
</tr>
<tr>
<td>ISBC 117  Personal Productivity with Information Technology  1</td>
</tr>
<tr>
<td>AVIT 222  IFR Regulations and Procedures  3</td>
</tr>
<tr>
<td>PSYC 111  or Introduction to Psychology  3</td>
</tr>
<tr>
<td>or SOC 110  or ANTH 171  or Introduction to Cultural Anthropology  3</td>
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**Credits  16**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ECON 202  Principles of Macroeconomics  3</td>
</tr>
<tr>
<td>ACCT 201  Elements of Accounting II  3</td>
</tr>
<tr>
<td>ECON 210  Introduction to Business and Economic Statistics  3</td>
</tr>
<tr>
<td>AVIT 323  Aircraft Systems  3</td>
</tr>
<tr>
<td>AVIT 324  Human Factors  2</td>
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**Credits  17**

**Junior Year**

<table>
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<th>Fall</th>
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<tbody>
<tr>
<td>MGMT 300  Principles of Management  3</td>
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<tr>
<td>AVIT 325  Multi-Engine Systems and Procedures  2</td>
</tr>
<tr>
<td>ISBC 217  Fundamentals of Computer Information Systems  3</td>
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<tr>
<td>or Introduction to Cultural Anthropology  3</td>
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**Credits  14**

### Management

#### B.B.A. in Management

**Freshman Year**

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<tbody>
<tr>
<td>ENGL 110  College Composition I  3</td>
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<td>MATH 103  College Algebra  3</td>
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<tr>
<td>AVIT 102  Introduction to Aviation  5</td>
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<tr>
<td>ATSC 110  Meteorology I  3</td>
</tr>
<tr>
<td>ATSC 110L  Meteorology I Laboratory  1</td>
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<tr>
<td>AVIT 100  Aviation Orientation  1</td>
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**Credits  16**

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<tbody>
<tr>
<td>ENGL 130  Composition II: Writing for Public Audiences  3</td>
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<tr>
<td>MATH 146  Applied Calculus I  3</td>
</tr>
<tr>
<td>POLS 115  American Government I  3</td>
</tr>
<tr>
<td>AVIT 208  Aviation Safety  3</td>
</tr>
<tr>
<td>AVIT 221  Basic Attitude Instrument Flying  3</td>
</tr>
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<td>AVIT 103  Introduction to Air Traffic Control  2</td>
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**Credits  17**

**Sophomore Year**

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<tbody>
<tr>
<td>ECON 201  Principles of Microeconomics  3</td>
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<td>ACCT 200  Elements of Accounting I  3</td>
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<tr>
<td>COMM 110  Fundamentals of Public Speaking  3</td>
</tr>
<tr>
<td>ISBC 117  Personal Productivity with Information Technology  1</td>
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<tr>
<td>AVIT 222  IFR Regulations and Procedures  3</td>
</tr>
<tr>
<td>PSYC 111  or Introduction to Psychology  3</td>
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<td>or SOC 110  or ANTH 171  or Introduction to Cultural Anthropology  3</td>
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**Credits  16**

<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>ECON 202  Principles of Macroeconomics  3</td>
</tr>
<tr>
<td>ACCT 201  Elements of Accounting II  3</td>
</tr>
<tr>
<td>ECON 210  Introduction to Business and Economic Statistics  3</td>
</tr>
<tr>
<td>AVIT 323  Aircraft Systems  3</td>
</tr>
<tr>
<td>AVIT 324  Human Factors  2</td>
</tr>
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**Credits  17**

**Junior Year**

<table>
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<tbody>
<tr>
<td>MGMT 300  Principles of Management  3</td>
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<td>AVIT 325  Multi-Engine Systems and Procedures  2</td>
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<tr>
<td>ISBC 217  Fundamentals of Computer Information Systems  3</td>
</tr>
<tr>
<td>or Introduction to Cultural Anthropology  3</td>
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</table>

**Credits  14**
### Banking & Financial Economics

#### B.B.A. in Banking & Financial Economics

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
<td>ENGL 110: College Composition I</td>
</tr>
<tr>
<td></td>
<td>POLS 115: American Government I</td>
</tr>
<tr>
<td></td>
<td>PSYC 111 or SOC 110 or ANTH 171: Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology</td>
</tr>
<tr>
<td></td>
<td>MATH 103: College Algebra</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Arts &amp; Humanities (FA)</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Spring</th>
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</tr>
</thead>
<tbody>
<tr>
<td>MATH 146: Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110: Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130: Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Arts &amp; Humanities (HUM)</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: US Diversity</td>
<td>3</td>
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<td><strong>Credits</strong></td>
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**Sophomore Year**

| Fall | ISBC 117: Personal Productivity with Information Technology | 1 |
| | ECON 201: Principles of Microeconomics | 3 |

### Business Economics

#### B.B.A. in Business Economics

<table>
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<th>Freshman Year</th>
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<tr>
<td>Fall</td>
<td>ENGL 110: College Composition I</td>
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<tr>
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<td>PSYC 111 or SOC 110 or ANTH 171: Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology</td>
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<td>MATH 103: College Algebra</td>
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<tbody>
<tr>
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<td>COMM 110: Fundamentals of Public Speaking</td>
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<tr>
<td>ENGL 130: Composition II: Writing for Public Audiences</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](http://und.edu/academics/essential-studies/requirements.cfm)
### Fall
- **ACCT 200** Elements of Accounting I 3
- **ISBC 117** Personal Productivity with Information Technology 1
- **ECON 201** Principles of Microeconomics 3

### Credits
- 17

**Sophomore Year**

**Fall**
- **ECON 210** Introduction to Business and Economic Statistics 3
- **ACCT 201** Elements of Accounting II 3
- **ECON 202** Principles of Macroeconomics 3
- **Electives** 9

### Credits
- 18

**Spring**
- **ECON 338** International Economics 3
- **ECON 309** Intermediate Macroeconomic Theory and Policy 3
- **ACCT 315** Business Law I 3
- **MGMT 301** Operations Management 3

### Credits
- 15

**Junior Year**

**Fall**
- **ECON 303** Money and Banking 3
- **FIN 310** Principles of Financial Management 3
- **ECON 308** Intermediate Microeconomic Theory 3
- **MGMT 300** Principles of Management 3
- **MRKT 305** Marketing Foundations 3

### Credits
- 15

**Spring**
- **ECON 309** Intermediate Macroeconomic Theory and Policy 3
- **ISBC 317** 3
- **ACCT 315** Business Law I 3
- **MGMT 301** Operations Management 3

### Credits
- 15

**Senior Year**

**Fall**
- **ISBC 320** Professional Communication for Business Special Emphasis - Adv Comm 3
- **ECON 410** Empirical Methods in Economics I 3
- **ECON Electives** 6
- **Electives** 3

### Credits
- 15

**Spring**
- **MGMT 475** Strategic Management 3
- **ECON 414** Managerial Economics 3
- **Electives** 3

### Credits
- 15

**Total Credits**
- 125

---

**Economics**

### B.B.A. in Business Economics

#### Freshman Year

**Fall**
- **ENGL 110** College Composition I 3
- **PSYC 111** or **SOC 110** or **ANTH 171** 3
- **MATH 103** College Algebra 3
- **POLS 115** American Government I 3

### Credits
- 15

**Spring**
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **COMM 110** Fundamentals of Public Speaking 3
- **MATH 146** Applied Calculus I 3
- **Essential Studies: Arts & Humanities (FA)** 3

### Credits
- 15

---

**Sophomore Year**

**Fall**
- **ACCT 200** Elements of Accounting I 3
- **ISBC 117** Personal Productivity with Information Technology 1
- **ECON 201** Principles of Microeconomics 3
- **Essential Studies: Lab Science** 4
- **Essential Studies/Special Emphasis: Global Diversity** 3
- **Essential Studies: Arts & Humanities** 3

### Credits
- 17

**Spring**
- **ECON 210** Introduction to Business and Economic Statistics 3
- **ACCT 201** Elements of Accounting II 3
- **ECON 202** Principles of Macroeconomics 3
- **Electives** 9

### Credits
- 18

**Junior Year**

**Fall**
- **ECON 303** Money and Banking 3
- **FIN 310** Principles of Financial Management 3
- **ECON 308** Intermediate Microeconomic Theory 3
- **MGMT 300** Principles of Management 3
- **MRKT 305** Marketing Foundations 3

### Credits
- 15

**Spring**
- **ECON 338** International Economics 3
- **ECON 309** Intermediate Macroeconomic Theory and Policy 3
- **ACCT 315** Business Law I 3
- **MGMT 301** Operations Management 3

### Credits
- 15

**Senior Year**

**Fall**
- **ISBC 320** Professional Communication for Business Special Emphasis - Adv Comm 3
- **ECON 410** Empirical Methods in Economics I 3
- **ECON Electives** 6
- **Electives** 3

### Credits
- 15

**Spring**
- **MGMT 475** Strategic Management 3

---

**Total Credits**
- 125

---

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Entrepreneurship

B.B.A. in Entrepreneurship

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<td>or SOC 110</td>
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<tr>
<td>or ANTH 171</td>
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<tr>
<td>COMM 110</td>
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<td>ENTR 386</td>
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| 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

Graphic Design Technology

B.S. in Graphic Design Technology

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<td>Essential Studies Lab Sciences</td>
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<td>TECH 112</td>
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<td>ENGL 130</td>
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<td>TECH 212</td>
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<td>TECH 311</td>
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| Credits       | 15     |

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## Human Resource Management

**B.B.A. in Human Resource Management**

### Freshman Year

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<td>POLS 115</td>
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<td>Essential Studies: Fine Arts and Humanities (FA)</td>
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### Sophomore Year

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### Junior Year

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<td>MRKT 305</td>
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<td>MGMT 407</td>
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<td>ACCT 315</td>
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<td>MGMT 407</td>
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<td>Human Resource Management Elective</td>
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### Total Credits

128

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---

**Strongly recommended courses for your Essential Studies area/open elective:** COMM 102; CSCI 101/T; SOC 110; ART 112; ART 114; LEAD 101; ANTH 171; SOC 250; ISYS 320. Please see your Advisor.
## Industrial Technology

### B.S in Industrial Technology

#### Freshman Year

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<td>TECH 122: Computer-Aided Design</td>
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<td>MATH 103: College Algebra</td>
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<td>PHYS 161: Introductory College Physics I</td>
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<td>ENGL 110: College Composition I</td>
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#### Spring

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<td>TECH 203: Production Processes &amp; Material Testing</td>
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<tr>
<td>MATH 105: Trigonometry</td>
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<td>PHYS 162: Introductory College Physics II</td>
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<td>ENGL 130: Composition II: Writing for Public Audiences</td>
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#### Sophomore Year

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<td>ECON 210: Introduction to Business and Economic Statistics</td>
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<td>TECH 201: Electromechanical Fundamentals</td>
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<td>TECH 204: Industrial Materials</td>
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#### Junior Year

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<td>TECH 433: Manufacturing Strategies</td>
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<td>TECH 223: Applied Synthetics</td>
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#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH 300: Technology and Society</td>
<td>3</td>
</tr>
<tr>
<td>TECH 340: Cost Estimating</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 302: Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>TECH 373: Advanced Manufacturing Processes (Select this course if pursuing an emphasis in Manufacturing Technologies)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Essential Studies</strong></td>
<td><strong>6</strong></td>
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<tr>
<td><strong>Credits</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>TECH 498: Senior Capstone I</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>TECH 403: Product Research and Development</td>
<td>3</td>
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<td></td>
<td>ENTR 305: Essential Studies</td>
<td>9</td>
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<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>TECH 440: Occupational Safety</td>
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</tr>
<tr>
<td>TECH 499: Senior Capstone II</td>
<td>3</td>
</tr>
<tr>
<td>TECH 420: Facilities Design</td>
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<tr>
<td><strong>Credits</strong></td>
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#### Total Credits

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>122</td>
<td>122</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 481 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. in Information Systems

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ENGL 110: College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 103: College Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>POLS 115: American Government I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PSYC 111: Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Essential Studies: Arts &amp; Humanities (FA)</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMM 110: Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146: Applied Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130: Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td><strong>Essential Studies: Arts &amp; Humanities (HUM)</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Essential Studies: US Diversity</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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</tbody>
</table>

#### Sophomore 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>ACCT 200: Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISBC 117: Personal Productivity with Information Technology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Essential Studies: Fine Arts &amp; Humanities</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Essential Studies: Lab Science</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Essential Studies: Global Diversity</strong></td>
<td>3</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>ISBC 317: Professional Communication for Business</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISBC 320: Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISBC 330: Database Design</td>
<td>3</td>
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<tr>
<td></td>
<td>ISBC 340: Fundamentals of Networking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MGMT 300: Principles of Management</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ISBC 350: Networking II</td>
<td>3</td>
</tr>
<tr>
<td>ISBC 370: Web Development</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 315: Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 305: Marketing Foundations</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>18</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Credit</th>
<th>Total Credit</th>
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<tbody>
<tr>
<td>18</td>
<td>18</td>
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</table>
### B.B.A. in Investments

#### Freshman Year
**Fall**
- ENGL 110: College Composition I 3
- MATH 103: College Algebra 3
- POLS 115: American Government I 3
- PSYC 111 or SOC 110 or ANTH 171: Introduction to Psychology or Introduction to Sociology or Introduction to Cultural Anthropology 3

**Credits** 15

#### Spring
- Essential Studies/Special Emphasis: Global Diversity 3
- COMM 110: Fundamentals of Public Speaking 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 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

**Credits** 15

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### B.B.A. 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

**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)

Special Emphasis courses can fulfill an essential studies requirement (example: History 104 will count toward the US Diversity as well as the Humanities area).
You must complete enough electives to bring total credit hours up to 125.

### Managerial Finance & Accounting

#### B.B.A. in Managerial Finance & Accounting

**Freshman Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Global Diversity</td>
<td>3</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>
<tr>
<td>MATH 146</td>
<td>Applied Calculus I</td>
</tr>
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</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Elective</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Lab Science</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts (U or G)</td>
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</tr>
<tr>
<td>Elective</td>
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**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
</tr>
<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
</tr>
<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
</tr>
<tr>
<td>MGMT 302</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>Elective</td>
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#### Credits: 18

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
</tr>
<tr>
<td>MGMT 310</td>
<td>Organizational Behavior</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
</tr>
<tr>
<td>Management Elective</td>
<td>3</td>
</tr>
<tr>
<td>Management Elective</td>
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**Senior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
</tr>
<tr>
<td>Management Elective</td>
<td>3</td>
</tr>
<tr>
<td>Special Emphasis: Advanced Communication</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td>Elective</td>
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**Credits: 15**

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MGMT 475</td>
<td>Strategic Management</td>
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<tr>
<td>Management Elective</td>
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<td>Management Elective</td>
<td>3</td>
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<tr>
<td>MGMT 400</td>
<td>Organizational Theory and Analysis</td>
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<tr>
<td>Elective</td>
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</table>

**Credits: 15**

| Total Credits | 128 |

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 overall GPA in all courses taken. In order to graduate with a BBA degree in Management, a student must earn a minimum cumulative CoBPA and institutional Grade Point Average of 2.75. (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.

**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
Marketing

B.B.A. in Marketing (Option A) (p. 315)

B.B.A. in Marketing (Option B)

B.B.A. in Marketing (Option A)

Freshman Year
First Semester Credits
ENGL 110 College Composition I 3
MATH 103 College Algebra 3
POLS 115 American Government I 3
PSYC 111 Introduction to Psychology 3
or SOC 110 or ANTH 171
Essential Studies: Fine Arts (FA) 3
Credits 15

Second Semester Credits
COMM 110 Fundamentals of Public Speaking 3
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 146 Applied Calculus I 3
ISBC 117 Personal Productivity with Information Technology 1
Essential Studies: Humanities 3
Electives 3
Credits 16

Sophomore Year
First Semester
ECON 201 Principles of Microeconomics 3
ACCT 200 Elements of Accounting I 3
Essential Studies: Fine Arts or Humanities 3
Essential Studies: US Diversity 3
Essential Studies: Global Diversity 3

Credits 15

Total Credits 127

1 = You must completed 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.

^^ 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 cont toward the US Diversity as well as the Humanities area).

B.B.A. in Marketing (Option B)

Freshman Year
First Semester Credits
ENGL 110 College Composition I 3
MATH 103 College Algebra 3
POLS 115 American Government I 3
PSYC 111 Introduction to Psychology 3
or SOC 110 or ANTH 171
Essential Studies: Humanities 3
Electives 3
Credits 15

Second Semester Credits
COMM 110 Fundamentals of Public Speaking 3
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 146 Applied Calculus I 3
ISBC 117 Personal Productivity with Information Technology 1
Essential Studies: Humanities 3
Electives 3
Credits 15

Total Credits 125

1 = Marketing 310 and 325 and 330 all must be taken SOMETIME in the junior year. ^^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
### Second Semester

<table>
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<tr>
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<th>Course Title</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>COMM 110</td>
<td>Fundamentals of Public Speaking</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>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Essential Studies: Humanities</td>
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<td>Essential Studies: US Diversity</td>
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**Total Credits:** 16

### Sophomore Year

**First Semester**

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<tr>
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<th>Course Title</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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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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<tr>
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<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>
</tr>
<tr>
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<td>Essential Studies: Humanities</td>
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<td>Essential Studies: US Diversity</td>
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**Total Credits:** 16

**Second Semester**

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<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
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<tr>
<td>ACCT 201</td>
<td>Elements of Accounting I</td>
<td>3</td>
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**Total Credits:** 16

### Junior Year

**First Semester**

<table>
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<tbody>
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<td>ISBC 320</td>
<td>Professional Communication for Business</td>
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<td>MRKT 305</td>
<td>Marketing Foundations</td>
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</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>
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<td>Electives</td>
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**Total Credits:** 15

**Second Semester**

<table>
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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MRKT 310</td>
<td>Consumer Behavior</td>
<td>3</td>
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<tr>
<td>MRKT 325</td>
<td>International Marketing</td>
<td>3</td>
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<td>MRKT 330</td>
<td>Marketing Research</td>
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<tr>
<td>MGMT 301</td>
<td>Operations Management</td>
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**Total Credits:** 15

### Senior Year

**First Semester**

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ISBC 217</td>
<td>Fundamentals of Computer Information Systems</td>
<td>1</td>
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**Total Credits:** 18

**Second Semester**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</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>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>
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</tbody>
</table>

**Total Credits:** 15

### Operations & Supply Chain Management

#### B.B.A. in Operations and Supply Chain Management

**Freshman Year**

**Fall**

<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>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>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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</table>

**Total Credits:** 15

**Spring**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<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>Lab Science</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
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**Total Credits:** 17

**Sophomore Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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</tr>
<tr>
<td>MGMT 309</td>
<td>Principles of Management</td>
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**Total Credits:** 15

**Spring**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</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>MGMT 301</td>
<td>Operations Management</td>
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<tr>
<td>FIN 310</td>
<td>Principles of Financial Management</td>
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**Total Credits:** 15

**Junior Year**

**Fall**

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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
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<td>Fundamentals of Computer Information Systems</td>
<td>3</td>
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<tr>
<td>MRKT 305</td>
<td>Marketing Foundations</td>
<td>3</td>
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<tr>
<td>ECON 303</td>
<td>Money and Banking</td>
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<tr>
<td>MGMT 301</td>
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**Total Credits:** 15

**Spring**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ACCT 315</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 309</td>
<td>Quantitative Methods for Managers</td>
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<td>MGMT 431</td>
<td>Supply Chain Management</td>
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<td>Electives</td>
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**Total Credits:** 15

**Senior Year**

**Fall**

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<th>Course Title</th>
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<tr>
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<td>Organizational Behavior</td>
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<td>Supplier Relationship Management</td>
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<tr>
<td>MGMT 433</td>
<td>Logistics in the Supply Chain</td>
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**Total 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
## Political Science

### B.A. in Political Science

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115 American Government I</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Global Diversity</td>
<td>3</td>
</tr>
<tr>
<td>Language 101</td>
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</table>

**Credits Total:** 16

#### Second Semester

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>ENGL 130</td>
</tr>
<tr>
<td>POLS 116 State and Local Government</td>
</tr>
<tr>
<td>Essential Studies: Fine Arts</td>
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<td>Language 102</td>
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**Credits Total:** 16

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>POLS 225 or POLS 250 Comparative Politics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 210 or PSYC 241 or SOC 326 Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Humanities</td>
<td>3</td>
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<td>Open Elective</td>
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**Credits Total:** 15

#### Second Semester

<table>
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<tbody>
<tr>
<td>POLS 220 International Politics</td>
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<td>ECON 202 Principles of Macroeconomics</td>
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<tr>
<td>Essential Studies: Science w/ Lab</td>
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<td>Open Electives</td>
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**Credits Total:** 16

#### Junior Year

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<thead>
<tr>
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<tbody>
<tr>
<td>POLS 300 Introduction Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>POLS 310 Introduction to Political Thought</td>
<td>3</td>
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<tr>
<td>POLS Elective</td>
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**Credits Total:** 16

---

**Notes:**

- The Department Political Science and Public Administration is housed within the College of Arts and Sciences.
- 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. in Public Administration

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115 American Government I</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Science with Lab Essential Studies</td>
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**Credits Total:** 15

#### Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMM 110 Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>POLS 116 State and Local Government</td>
</tr>
<tr>
<td>Global Diversity Essential Studies</td>
</tr>
<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<tr>
<td>Humanities Essential Studies</td>
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**Credits Total:** 15

#### Sophomore Year

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>POLS 250 Introduction to Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 200 Elements of Accounting I</td>
<td>3</td>
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<tr>
<td>ISBC 117 Personal Productivity with Information Technology</td>
<td>1</td>
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<tr>
<td>US Diversity Essential Studies</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts or Humanities Essential Studies</td>
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</table>

**Credits Total:** 16
Second Semester
ACCT 201 Elements of Accounting II 3
ECO 202 Principles of Macroeconomics 3
ECO 210 Introduction to Business and Economic Statistics 3
Open Electives 6

Credits 15

Junior Year
First Semester
POLS 300 Introduction Research Methods 3
POLS 329 Presidents Institutions and Management 3
MGMT 300 Principles of Management 3
Open Electives 7

Credits 16

Second Semester
ECO 324 Public Finance 3
POLS 328 Legislative Processes 3
POLS 432 Public Policy Making Process 3
Open Electives 7

Credits 16

Senior Year
First Semester
MGMT 310 Organizational Behavior 3
or SOC 431 Organizational Theory and Analysis 3
MGMT 400 Organizational Theory and Analysis 3
Open Electives 9

Credits 15

Second Semester
POLS 404 Urban Politics and Administration 3
POLS 437 Administrative Processes 3
POLS 495 Senior Colloquium in Political Science and Public Administration 3
Open Electives 7

Credits 16

Total Credits 125

Early Childhood Education
B.S. ED. with a Major in Early Childhood Education

Freshman Year
First Semester

<table>
<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>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>FA 150 or THEA 110</td>
<td>Introduction to the Fine Arts or Introduction to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
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</tr>
<tr>
<td>Essential Studies: Arts &amp; Humanities (Fine Arts)</td>
<td>3</td>
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<tr>
<td>Essential Studies: Math/Sci/Tech</td>
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Second Semester

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ECON 324</td>
<td>Public Finance</td>
<td>3</td>
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<tr>
<td>Essential Studies: Math/Sci/Tech</td>
<td>3-4</td>
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</tr>
<tr>
<td>T&amp;L 310</td>
<td>Introduction to Early Childhood 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>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Arts and Humanities (Humanities)</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>T&amp;L 250</td>
<td>Introduction to Education</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 313</td>
<td>Language Development and Emerging Literacy</td>
<td>3</td>
</tr>
<tr>
<td>Essential Studies: Social Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Essential Studies: Math/Sci/Tech</td>
<td>3-4</td>
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Second Semester

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<tr>
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<tbody>
<tr>
<td>T&amp;L 320</td>
<td>Infant and Toddler</td>
<td>3</td>
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<tr>
<td>T&amp;L 336</td>
<td>Social and Emotional Development and Guidance of Children</td>
<td>3</td>
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<tr>
<td>T&amp;L 328</td>
<td>Survey of Children’s Literature</td>
<td>3</td>
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<tr>
<td>T&amp;L 335</td>
<td>Understanding Readers and Writers</td>
<td>3</td>
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<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 453</td>
<td>Methods and Materials: Kindergarten</td>
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Junior Year
First Semester

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 311</td>
<td>Observing and Assessing Children</td>
<td>3</td>
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<tr>
<td>T&amp;L 411</td>
<td>Primary Reading and Language Arts</td>
<td>2</td>
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<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
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<tr>
<td>T&amp;L 443</td>
<td>Mathematics for Primary Grades</td>
<td>2</td>
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<tr>
<td>T&amp;L 333</td>
<td>Methods and Materials: Pre-Kindergarten</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>1</td>
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<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
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Second Semester

<table>
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<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 410</td>
<td>Teaching Reading in the Elementary School Classroom (TEAM)</td>
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<tr>
<td>T&amp;L 430</td>
<td>Social Studies in the Elementary School (Team)</td>
<td>3</td>
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<tr>
<td>T&amp;L 440</td>
<td>Mathematics in Elementary School (Team)</td>
<td>3</td>
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<tr>
<td>T&amp;L 470</td>
<td>Science in the Elementary School (TEAM)</td>
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<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
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</table>
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**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 151</td>
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<tr>
<td>or GEOG 161</td>
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</tr>
<tr>
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<td>2-4</td>
</tr>
<tr>
<td>FA 150</td>
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<tr>
<td>or THEA 110</td>
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<tr>
<td>HIST 101</td>
<td>3</td>
</tr>
<tr>
<td>or HIST 102</td>
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<tr>
<td>or HIST 103</td>
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<tr>
<td>or HIST 104</td>
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<td>or HIST 105</td>
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<tr>
<td>or HIST 106</td>
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**Credits** 14-16

**Second Semester**

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<tbody>
<tr>
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<td>COMM 110</td>
<td>3</td>
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<tr>
<td>ENGL 130</td>
<td>3</td>
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<tr>
<td>Humanities 3</td>
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<td>MATH 103</td>
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<td>Social Science 2</td>
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**Credits** 18

**Sophomore Year**

**First Semester**

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<tr>
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<td>3</td>
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**Credits** 14-16

**Second Semester**

<table>
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<tbody>
<tr>
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<td>or T&amp;L 329</td>
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<tr>
<td>T&amp;L 335</td>
<td>3</td>
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<tr>
<td>T&amp;L 339</td>
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<td>MATH 277</td>
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**Credits** 14-16

**Junior Year**

**First Semester**

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<td>3</td>
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<tr>
<td>T&amp;L 430</td>
<td>3</td>
</tr>
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<td>T&amp;L 440</td>
<td>3</td>
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<tr>
<td>T&amp;L 470</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
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**Credits** 17

**Second Semester**

<table>
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<th>Credits</th>
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<tr>
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<td>2</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>3</td>
</tr>
<tr>
<td>Science 1</td>
<td>3-4</td>
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**Credits** 14

**Senior Year**

**First Semester**

<table>
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<tbody>
<tr>
<td>T&amp;L 410</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 430</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 440</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 470</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>2</td>
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**Credits** 17

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 410</td>
<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>T&amp;L 440</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 470</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>2</td>
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**Credits** 17

**Total Credits** 125-132

1 = To obtain a teaching license in North Dakota, coursework must be completed in life, physical, earth, and space sciences, two of which must have a corresponding lab. See academic advisor for a complete list of course options. 2 = 3 additional social science credits are required. 3 = 3 additional credits of humanities are required. 4 = A 20 unit Minor or Specialty Area is required. See your academic advisor for additional information. ** 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

**Kinesiology**

**B.S. in Kinesiology: Option A-Teacher Education/Certification** (p. 319)

**B.S. in Kinesiology: Option B-Related Areas or Option D-Allied Health** (p. 320)

**B.S. in Kinesiology: Option C** (p. 321)

**B.S. in Public Health Education (B.S.P.H.E.)** (p. 321)
B.S. in Kinesiology: Option A-Teacher Education/Certification

Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
<td>CHEM 115</td>
<td>Introductory Chemistry</td>
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<tr>
<td></td>
<td>CHEM 115L</td>
<td>Introductory Chemistry Laboratory</td>
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</tr>
<tr>
<td></td>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
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<td></td>
<td></td>
<td>Essential Studies</td>
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<td>NUTR 240</td>
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<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
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<td>T&amp;L 252</td>
<td>Child Development</td>
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<td><strong>Credits</strong></td>
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</table>
| 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       |

Senior Year

<table>
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<tr>
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<tr>
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<td>KIN 332</td>
<td>Biomechanics</td>
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<td>KIN 332L</td>
<td>Biomechanics Laboratory</td>
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<td>KIN 410</td>
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<td>Methods and Materials for Teaching Physical &amp; Health Education in the Secondary School-Laboratory</td>
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<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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<td>KIN 227</td>
<td>Dance: Movement Performance and Analysis (MP&amp;A)</td>
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<td>KIN 233</td>
<td>Racquet Sports: Movement Performance and Analysis (MP&amp;A)</td>
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<td>KIN 232</td>
<td>Outdoor Pursuits: Movement Performance and Analysis (MP&amp;A)</td>
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<tr>
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<td>KIN 491</td>
<td>Senior Capstone</td>
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<td>T&amp;L 487</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.S. in Kinesiology: Option B-Related Areas or Option D-Allied Health

Freshman Year

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Fall</td>
<td>CHEM 115</td>
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<td>CHEM 115L</td>
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<td>ENGL 110</td>
<td>College Composition I</td>
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<td>SOC 110</td>
<td>Introduction to Sociology</td>
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<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<td>Spring</td>
<td>KIN 420</td>
<td>Curriculum Development for Physical and Health Education</td>
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Sophomore Year

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<td>Child Development</td>
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<td>Fundamentals of Public Speaking</td>
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<td>NUTR 240</td>
<td>Fundamentals of Physical Conditioning</td>
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<td>KIN 326</td>
<td>Fundamentals of Physical Conditioning</td>
<td>3</td>
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<td>Aquatics: Movement Performance and Analysis (MP&amp;A)</td>
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<td>PPT 301</td>
<td>Human Physiology</td>
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<td>KIN 401</td>
<td>Sport Sociology</td>
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<td>Related Area/Pre-Allied Health Requirement</td>
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<tr>
<td>Fall</td>
<td>KIN 207</td>
<td>Prevention and Care of Physical Activity Injuries</td>
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<tr>
<td>Fall</td>
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<td>Introduction to Teaching in Physical Education and Coaching</td>
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<td>KIN 390L</td>
<td>Introduction to Teaching in Physical Education and Coaching Laboratory</td>
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<td>KIN 402</td>
<td>Exercise Physiology</td>
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<td>KIN 402L</td>
<td>Exercise Physiology Laboratory</td>
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<td>KIN 327</td>
<td>Fitness for Life</td>
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<td></td>
<td>KIN 236</td>
<td>Team Sports: Movement Performance and Analysis (MP&amp;A)</td>
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<td>KIN 290</td>
<td>Physical Education Activities for the Elementary Grades</td>
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<td>Application into Teacher education</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>Spring</td>
<td>KIN 404</td>
<td>Adapted Physical Activity</td>
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<td>KIN 276</td>
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<td>KIN 276L</td>
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<td>KIN 400</td>
<td>Methods and Materials for Teaching Physical Education Elementary School</td>
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<td>KIN 400L</td>
<td>Methods and Materials for Teaching Physical Education in the Elementary School-Laboratory</td>
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<td>KIN 355</td>
<td>Applied Motor Development</td>
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<tr>
<td>Fall</td>
<td>KIN 224</td>
<td>Aquatics: Movement Performance and Analysis (MP&amp;A)</td>
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<tbody>
<tr>
<td>Fall</td>
<td>KIN 390</td>
<td>Introduction to Teaching in Physical Education and Coaching</td>
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<td>KIN 390L</td>
<td>Introduction to Teaching in Physical Education and Coaching Laboratory</td>
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<td>KIN 402</td>
<td>Exercise Physiology</td>
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<td>KIN 402L</td>
<td>Exercise Physiology Laboratory</td>
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<td>KIN 290</td>
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<td>Application into Teacher education</td>
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<td><strong>Credits</strong></td>
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</table>
KIN 231  Individual Sports/Activities: Movement Performance and Analysis (MP&A)  1
KIN 440  Sport Psychology  3
Complete Criminal Background Check  
Essential Studies  3

Credits  15

Junior Year
Fall
KIN 402  Exercise Physiology  3
KIN 402L  Exercise Physiology Laboratory  1
KIN 236  Team Sports: Movement Performance and Analysis (MP&A)  1

Related Area/Pre-Allied Health Requirement  11

Credits  16

Spring
Related Area/Pre-Allied Health Requirement  12
KIN 404  Adapted Physical Activity  3
KIN 276  Motor Learning  2
KIN 276L  Motor Learning Lab  1

Credits  18

Senior Year
Fall
Related Area/Pre-Allied Health Requirement  9
KIN 332  Biomechanics  3
KIN 332L  Biomechanics Laboratory  1

Credits  13

Spring
Essential Studies: Senior Capstone  3
Related Area/Pre-Allied Health Requirement  9
KIN 355  Applied Motor Development  3

Credits  15

Total Credits  125

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

B.S. in Kinesiology: Option C

Freshman Year
Fall  Credits
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  13

Credits  13

Spring
ENGL 130  Composition II: Writing for Public Audiences  3
NUTR 240  3
COMM 110  Fundamentals of Public Speaking  3
KIN 240  Introduction to Wellness  2

Essential Studies  3

Credits  11

Sophomore Year
Fall
ANAT 204  Anatomy for Paramedical Personnel  3
ANAT 204L  Anatomy for Paramedical Personnel Laboratory  2
KIN 326  Fundamentals of Physical Conditioning  3

Essential Studies  3

Credits  15

B.S. in Public Health Education (B.S.P.H.E.)

Freshman Year
Fall  Credits
ENGL 110  College Composition I  3
PHE 101  Introduction to Public Health  3
PHE 103  Introduction to Global Health  3

Essential Studies  6

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
## Middle Level Education

**B.S. ED. with a Major in Middle Level Education**

### Freshman Year

<table>
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<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
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<td>Social Science</td>
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### Sophomore Year

#### Fall

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<tr>
<td>KIN 110 First Aid and CPR</td>
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<tr>
<td>ANAT 204 Anatomy for Paramedical Personnel</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>Electives</td>
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**Credits**: 15

#### Spring

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<tr>
<td>PPT 301 Human Physiology</td>
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<td>Electives</td>
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**Credits**: 15

### Junior Year

#### Fall

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<tr>
<td>PHE 301 Principles and Foundation of Health Education</td>
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<td>PHE 302 Community Health</td>
<td>3</td>
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<td>KIN 327 Fitness for Life</td>
<td>3</td>
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<td>KIN 240 Introduction to Wellness</td>
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<td>Electives</td>
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**Credits**: 14

#### Spring

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<td>PHE 304 Health Program Planning and Implementation</td>
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**Credits**: 12

### Senior Year

#### Summer

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<td>PHE 415 Public Health Internship</td>
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**Credits**: 15

#### Fall

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<td>PHE 306 Epidemiology and Biostatistics</td>
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<td>PHE 307 Methods and Materials of Health Education</td>
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#### Spring

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<tr>
<td>PHE 303 Organization and Administration of Community Health Programs</td>
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<td>PHE 305 Program Evaluation and Research Design</td>
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<td>Electives</td>
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<tr>
<td>Senior Capstone</td>
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**Credits**: 13

**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

**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.**

**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
# Rehabilitation & Human Services

## B.S. in Rehabilitation and Human Services

### Freshman Year

<table>
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<tr>
<th>Semester</th>
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<tr>
<td>First</td>
<td>ENGL 110</td>
<td>College Composition I</td>
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<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<td>BIOL 111</td>
<td>Concepts of Biology (Or any ES science course)</td>
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<td>BIOL 111L</td>
<td>Concepts of Biology Laboratory (Or any ES lab course)</td>
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<td>MUSC 100</td>
<td>Introduction to the Understanding of Music (Or any ES Fine Arts course)</td>
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<td>FA 150</td>
<td>Introduction to the Fine Arts (Or any 3 credit elective)</td>
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### Second Semester

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<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
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<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
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<tr>
<td>HIST 101</td>
<td>Western Civilization I (Or any ES Humanities course)</td>
<td>3</td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to American Indian Studies (Or any 3 credit elective)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
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### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>RHS 200</td>
<td>Helping Skills in Community Services</td>
<td>3</td>
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<tr>
<td></td>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PSYC 250</td>
<td>Developmental Psychology</td>
<td>4</td>
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<tr>
<td></td>
<td>NUTR 240</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGL 225</td>
<td>Introduction to Film (Or any 3 credit elective)</td>
<td>3</td>
</tr>
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<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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<tbody>
<tr>
<td>RHS 250</td>
<td>Contemporary Issues in Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>COUN 250</td>
<td>Dialogue on U.S. Diversity</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>HIST 102</td>
<td>Western Civilization II (Or any approved ES Arts &amp; Humanities course)</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 101</td>
<td>Introduction to Philosophy (Or any 3 credit elective)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>First</td>
<td>RHS 350</td>
<td>Overview of Disabilities</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>RHS 455</td>
<td>Rehabilitation Process</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SOC 361</td>
<td>Social Psychology</td>
<td>3</td>
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<tr>
<td></td>
<td>RTS 201</td>
<td>Recreation and Society</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SOC 355</td>
<td>Drugs and Society (Or any 3 credit emphasis course)</td>
<td>3</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>RHS 450</td>
<td>Vocational Assessment and Job Acquisition</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 360</td>
<td>Introduction to Personality</td>
<td>3</td>
</tr>
<tr>
<td>RHS 499</td>
<td>Special Topics</td>
<td>1-3</td>
</tr>
<tr>
<td>T&amp;L 319</td>
<td>Inclusive Strategies (Or any 3 credit emphasis course)</td>
<td>3</td>
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### Summer

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>RHS 493</td>
<td>Senior Capstone Seminar</td>
<td>3</td>
</tr>
<tr>
<td>RHS 497</td>
<td>Internship in Rehabilitation</td>
<td>9</td>
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<tr>
<td><strong>Credits</strong></td>
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</table>

These course may also be taken in the summer of the Senior Year.

---

# Science Education

## B.S. ED. with a Major in Science Education

### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Science 1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arts &amp; Humanities (Fine Arts)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science Course Area 1 ²</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>Science Course Area 2 ³</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>15-17</strong></td>
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</table>

### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<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>Social Science 1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Arts &amp; Humanities (HUM)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Science Course Area 1 ²</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Science Course Area 2 ³</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>15-17</strong></td>
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</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>T&amp;L 250</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>T&amp;L 319</td>
<td>Inclusive Strategies</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Science 1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arts &amp; Humanities (FA or HUM)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science Course Area 1 ²</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>Science Course Area 2 ³</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td><strong>Credits</strong></td>
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<td><strong>18-20</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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</thead>
<tbody>
<tr>
<td>T&amp;L 339</td>
<td>Technology for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Science Course Area 1 ²</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>18-20</strong></td>
</tr>
</tbody>
</table>

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.
### Social Studies Education

**B.S. ED. with a Major in Social Studies Education**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Math/Science/Technology 1</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GEOG 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>United States to 1877</td>
<td>3</td>
</tr>
<tr>
<td>POLS 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>15-16</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>Elective 2</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
</tr>
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**Junior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 345</td>
<td>Curriculum Development and Instruction</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of the Adolescent</td>
</tr>
<tr>
<td>Science Course Area 1 2</td>
<td>4</td>
</tr>
<tr>
<td>Science Course Area 3 4</td>
<td>4</td>
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<tr>
<td><strong>Credits</strong></td>
<td><strong>14</strong></td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 432</td>
</tr>
<tr>
<td>MATH 166</td>
</tr>
<tr>
<td>MATH 321</td>
</tr>
<tr>
<td>or PSYC 241</td>
</tr>
<tr>
<td>or ECON 210</td>
</tr>
</tbody>
</table>

| Science Course Area 1 2 | 3-4 |
| Science Course Area 3 4 | 3-4 |
| **Credits** | **16-18** |

**Senior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 400</td>
<td>Methods and Materials</td>
</tr>
<tr>
<td>T&amp;L 401</td>
<td>School Safety Science</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
</tr>
<tr>
<td>Science Course Area 4 5</td>
<td>4</td>
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<tr>
<td><strong>Credits</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 487</td>
</tr>
<tr>
<td>T&amp;L 488</td>
</tr>
<tr>
<td>T&amp;L 489</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
</tr>
</tbody>
</table>

**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

### Sophomore Year

**First Semester**

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HIST 104</td>
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<tr>
<td>MATH 103</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 201</td>
</tr>
<tr>
<td>T&amp;L 250</td>
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<tr>
<td>T&amp;L 319</td>
</tr>
<tr>
<td>Math/Science/Technology 1</td>
</tr>
<tr>
<td>or ECON 210</td>
</tr>
<tr>
<td>Electives (Social Science)</td>
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### Junior Year

**First Semester**

<table>
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<tbody>
<tr>
<td>T&amp;L 339</td>
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<td>T&amp;L 350</td>
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<td>ECON 303</td>
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<td>HIST 220</td>
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<tr>
<td>POLS 305</td>
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<tr>
<td>or POLS 306</td>
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<tr>
<td>or POLS 308</td>
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<tr>
<td>or POLS 310</td>
</tr>
<tr>
<td>or POLS 318</td>
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<tr>
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**Second Semester**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>T&amp;L 345</td>
</tr>
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<td>T&amp;L 433</td>
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<tr>
<td>GEOG 262</td>
</tr>
<tr>
<td>GEOG 419</td>
</tr>
<tr>
<td>Electives in History (300 or above)</td>
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### Senior Year

**First Semester**

<table>
<thead>
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<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 400</td>
</tr>
<tr>
<td>T&amp;L 486</td>
</tr>
<tr>
<td>T&amp;L 432</td>
</tr>
<tr>
<td>ECON 210</td>
</tr>
<tr>
<td>or ECON 330</td>
</tr>
<tr>
<td>GEOG 271</td>
</tr>
<tr>
<td>or GEOG 377</td>
</tr>
<tr>
<td>or GEOG 471</td>
</tr>
<tr>
<td>or GEOG 474</td>
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<tr>
<td><strong>Credits</strong></td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>T&amp;L 487</td>
</tr>
<tr>
<td>T&amp;L 488</td>
</tr>
<tr>
<td>T&amp;L 489</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
</tr>
</tbody>
</table>

**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; SOQ 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

B.S. in Civil Engineering

B.S. in Electrical Engineering

B.S. in Geology

B.S. in Mechanical Engineering

B.S. in Petroleum Engineering

Chemical Engineering

B.S. in Chemical Engineering

Freshman Year

Fall
CHEM 221 Fundamentals of Chemistry - Concepts 1  
CHEM 221L Fundamentals of Chemistry Laboratory 1  
MATH 165 Calculus I  
Essential Studies: Arts & Humanities  
ENGL 110 College Composition I

Credits 17

Spring
CHE 102 Introduction to Chemical Engineering  
PHYS 251 University Physics I  
CHEM 254 Inorganic Chemistry I  
CHEM 254L Inorganic Chemistry I Laboratory 1  
MATH 166 Calculus II  
Essential Studies: Arts & Humanities

Credits 17

Sophomore Year

Fall
MATH 265 Calculus III  
PHYS 252 University Physics II  
CHE 201 Chemical Engineering Fundamentals  
ENGL 130 Composition II: Writing for Public Audiences  
ENGR 201 Statics

Credits 17

Spring
CHE 206 Unit Operations in Chemical Engineering  
CHE 232 Chemical Engineering Laboratory I  
CHE 315 Statistics and Numerical Methods in Engineering  
CHEM 340 Survey of Organic Chemistry  
CHEM 340L Survey of Organic Chemistry Laboratory  
MATH 266 Elementary Differential Equations

Credits 16

Junior Year

Fall
CHE 301 Introduction to Transport Phenomena  
ENGR 206 Fundamentals of Electrical Engineering  
Technical Elective II

Credits 16

Senior Year

Fall
Advanced Chemical Science Elective  
CHE 408 Process Dynamics and Control  
CHE 411 Plant Design I: Process Design and Economics  
CHE 431 Chemical Engineering Laboratory IV  
CHEM 470 Thermodynamics & Kinetics

Credits 17

Civil Engineering

B.S. in Civil Engineering

Freshman Year

Fall
CHEM 121 General Chemistry I or Biol 150  
CHEM 121L General Chemistry I Laboratory or Biol 150L  
ENGL 110 College Composition I  
ENGR 101 Graphical Communication  
MATH 165 Calculus I

Credits 17

Spring
Essential Studies Elective Arts and Humanities  
CHEM 122 General Chemistry II or Biol 150  
CHEM 122L General Chemistry II Laboratory or Biol 150L  
CE 101 Introduction to Civil Engineering and Sustainable Design  
ENGL 130 Composition II: Writing for Public Audiences  
ENGR 200 Computer Applications in Engineering  
MATH 166 Calculus II

Credits 17
B.S. in Electrical Engineering

B.S. in Electrical Engineering with Aerospace Focus (p. 327)

B.S. in Electrical Engineering with Biomedical Focus (p. 328)

B.S. in Electrical Engineering with Computer Science Focus (p. 329)

Chem 121 and 121L are required. Chem 122 and 122L or Biol 150 and 150L required.

CE Technical Electives: CE Department or non-departmental courses specifically approved by CE Department and having direct application in civil engineering practice or Department scheduled CE 397 Cooperative Education experience. **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**
Non EE elective 4
A&H or SS elective 2,3

Credits 17

Second Semester
EE 309 Electronics Lab II 1
EE 405 Control Systems I 3
EE 405L Control Systems Laboratory 1
EE 409 Distributed Networks 3
EE 421 Electronics II 3
EE 452 Embedded Systems 3
EE 452L Embedded Systems Design Laboratory 1

Credits 15

Senior Year
First Semester
EE 401 Electric Drives 5 3
EE 401L Electric Drives Laboratory 1
EE 480 Senior Design I 3
Electrical Engineering Elective 7 3
Electrical Engineering Elective 7 3

Credits 12

Electronics Lab II

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).

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 202 Electrical Engineering 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

Freshman Year
First Semester
Credits
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 Sciences Elective (SS) 2,3 3
Humanities Elective (A&H) 2,3 3

Credits 18

Second Semester
EE 201 Introduction to Digital Electronics 2
EE 202 Electrical Engineering Laboratory 1
EE 304 Computer Aided Measurement and Controls 3
MATH 166 Calculus II 4
PHYS 251 University Physics I 4
Fine Arts Elective (A&H) 2,3 3

Credits 17

Sophomore Year
First Semester
Credits
EE 206 Circuit Analysis 3
EE 306 Circuits Laboratory I 1
ENGL 130 Composition II: Writing for Public Audiences 3
MATH 207 Introduction to Linear Algebra 2
MATH 265 Calculus III 4
PHYS 252 University Physics II 4

Credits 17

Second Semester
AVIT 102 Introduction to Aviation 5
EE 307 Circuits Laboratory II 1
EE 313 Linear Electric Circuits 3
EE 318 Engineering Data Analysis 3
ENGR 460 Engineering Economy(SS) 3
MATH 266 Elementary Differential Equations 3

Credits 18

Junior Year
First Semester
Credits
AVIT 221 Basic Attitude Instrument Flying 3
EE 308 Electronics Laboratory I 1
EE 314 Signals and Systems 3
EE 314L Signal and Systems Laboratory 1
EE 316 Electric and Magnetic Fields 3
EE 321 Electronics I 3
A&H or SS Elective 2,3 3

Credits 17

Second Semester
AVIT 323 Aerodynamics - Airplanes 3
AVIT 324 Aircraft Systems 3
EE 309 Electronics Lab II 1

Credits

University of North Dakota
B.S. in Electrical Engineering with Biomedical Focus

Freshman Year

<table>
<thead>
<tr>
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<tbody>
<tr>
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First Semester

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<td>BIOL 151</td>
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<td>CHEM 121</td>
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<td>CHEM 121L</td>
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<td>ENGL 110</td>
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<td>MATH 165</td>
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<td>MATH 166</td>
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Second Semester

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<td>MATH 166</td>
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<td>PHYS 251</td>
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Junior Year

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<td>BIOL 314</td>
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<td>BIOL 314L</td>
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<td>BIOL 316</td>
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Second Semester

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<tr>
<td>EE 309</td>
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<td>EE 405</td>
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Senior Year

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<th>Course</th>
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<tr>
<td>EE 480</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<td>Electrical Engineering Elective</td>
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<td>Humanities Elective (A&amp;H)</td>
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<tr>
<td>Fine Arts Elective (A&amp;H)</td>
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</table>

Credits 15

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 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).

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).
### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 481  Senior Design II</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<tr>
<td>Non EE-Elective</td>
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<tr>
<td>Ethics Elective (A&amp;H or SS)</td>
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</tr>
<tr>
<td>A&amp;H or SS Elective</td>
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<tr>
<td><strong>Total Credits</strong></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 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 non-EE elective requirement. 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).
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. Recommended EE elective: EE 550 Bioinstrumentation. 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); PHIL 251 (AH, Humanities); CHE 340 (SS); and ME 370 (SS). "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. in Electrical Engineering with Computer Science Focus

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 121</td>
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<td>CHEM 121L</td>
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<tr>
<td>CSCI 130 or CSCI 160</td>
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<tr>
<td>EE 101</td>
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<td>ENGL 110</td>
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#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CSCI 161 Computer Science II</td>
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### Sophomore Year

#### First Semester

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>CSCI 230 Systems Programming</td>
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<tr>
<td>EE 206</td>
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<td>EE 306</td>
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<tr>
<td>MATH 208 Discrete Mathematics</td>
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<tr>
<td>MATH 265 Calculus III</td>
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<tr>
<td>PHYS 251 University Physics I</td>
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#### Second Semester

<table>
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<tbody>
<tr>
<td>EE 307</td>
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<td>EE 313</td>
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<td>EE 318</td>
<td>3</td>
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<tr>
<td>ENGR 460 Engineering Economy(SS)</td>
<td>3</td>
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<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252 University Physics II</td>
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### Junior Year

#### First Semester

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<tbody>
<tr>
<td>EE 308</td>
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<tr>
<td>EE 314</td>
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<tr>
<td>EE 314L Signal and Systems Laboratory</td>
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<tr>
<td>EE 316 Electric and Magnetic Fields</td>
<td>3</td>
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<td>EE 321</td>
<td>3</td>
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<tr>
<td>EE 451 Computer Hardware Organization</td>
<td>3</td>
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<tr>
<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<tr>
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#### Second Semester

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>EE 309</td>
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<tr>
<td>EE 405 Control Systems I</td>
<td>3</td>
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<td>EE 405L Control Systems Laboratory</td>
<td>1</td>
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<tr>
<td>EE 409 Distributed Networks</td>
<td>3</td>
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<td>EE 421</td>
<td>3</td>
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<tr>
<td>EE 452 Embedded Systems</td>
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<tr>
<td>EE 452L Embedded Systems Design Laboratory</td>
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### Senior Year

#### First Semester

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<tr>
<td>Computer Science Elective</td>
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<tr>
<td>EE 480 Senior Design I</td>
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<tr>
<td>Electrical Engineering Elective</td>
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<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
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<tr>
<td>**Social Science Elective (SS)</td>
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#### Second Semester

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<tr>
<td>EE 481 Senior Design II</td>
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<td>A&amp;H or SS Elective</td>
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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.

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4- EE 480 meets the Essential Studies Special Emphasis requirements for Advanced Communication (A) and Senior Capstone (C).

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.

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<tr>
<td>CHEM 121 General Chemistry I</td>
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<td>CHEM 121L General Chemistry I Laboratory</td>
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<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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<tr>
<td>Social Science Elective (SS)</td>
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<tr>
<td>Humanities Elective (A&amp;H)</td>
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<tr>
<td>EE 201 Introduction to Digital Electronics</td>
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<td>EE 202 Electrical Engineering Laboratory</td>
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<tr>
<td>EE 304 Computer Aided Measurement and Controls</td>
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<td>MATH 166 Calculus II</td>
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<td>PHYS 251 University Physics I</td>
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<td>Fine Arts Elective (A&amp;H)</td>
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<tr>
<td>EE 206 Circuit Analysis</td>
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<td>EE 306 Circuits Laboratory I</td>
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<td>ENGL 130 Composition II: Writing for Public Audiences</td>
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<tr>
<td>MATH 207 Introduction to Linear Algebra</td>
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<td>PHYS 252 University Physics II</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>EE 307 Circuits Laboratory II</td>
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<tr>
<td>EE 313 Linear Electric Circuits</td>
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<tr>
<td>EE 318 Engineering Data Analysis</td>
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<td>ENGR 460 Engineering Economy</td>
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<td>MATH 266 Elementary Differential Equations</td>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>EE 308 Electronics Laboratory I</td>
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<td>EE 314 Signals and Systems</td>
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<td>EE 314L Signal and Systems Laboratory</td>
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<td>EE 316 Electric and Magnetic Fields</td>
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<td>EE 321 Electronics I</td>
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<tr>
<td>Non EE elective</td>
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| **Second Semester** |       |
| EE 309 Electronics Lab II | 1 |
| EE 405 Control Systems I | 3 |
| EE 405L Control Systems Laboratory | 1 |
| EE 409 Distributed Networks | 3 |
| EE 421 Electronics II | 3 |
| EE 452 Embedded Systems | 3 |
| EE 452L Embedded Systems Design Laboratory | 1 |
| **Total Credits** | **15** |

<table>
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<th>Senior Year</th>
<th>Credits</th>
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<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>EE 401 Electric Drives</td>
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<td>EE 401L Electric Drives Laboratory</td>
<td>1</td>
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<tr>
<td>EE 480 Senior Design I</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering Elective</td>
<td>7</td>
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<tr>
<td>Electrical Engineering Elective</td>
<td>7</td>
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<tr>
<td><strong>Total Credits</strong></td>
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| **Second Semester** |       |
| EE 481 Senior Design II (b) | 6 |
| Electrical Engineering Elective | 7 |
| Electrical Engineering Elective | 7 |
| Ethics Elective (A&H or SS) | 2,3,8 |
| **Total 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).

6 – EE 481 meets the Essential Studies Special Emphasis requirement for Oral Communication (O).
### Geology

#### B.S. in Geology

**Freshman Year**

<table>
<thead>
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<th>Fall</th>
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<tbody>
<tr>
<td>GEOL 101 Introduction to Geology</td>
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<td>GEOL 101L Introduction to Geology Laboratory</td>
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<td>ENGL 110 College Composition I</td>
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<td>CHEM 121 General Chemistry I</td>
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<td>CHEM 121L General Chemistry I Laboratory</td>
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<td>MATH 165 Calculus I</td>
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**Credits** 15

<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>MATH 166 Calculus II</td>
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<tr>
<td>PHYS 211 College Physics I</td>
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<td>PHYS 211CL College Physics I Laboratory</td>
<td>1</td>
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<tr>
<td>GEOL 102 The Earth Through Time</td>
<td>3</td>
</tr>
<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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</table>

**Credits** 16

<table>
<thead>
<tr>
<th>Sophomore Year</th>
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</table>

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOL 220 Computer Applications in Geology and Environmental Science</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 256 Critical Thinking in the Geosciences</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 320 Petrology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122 General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122L General Chemistry II Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 212 College Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 212CL College Physics II Laboratory</td>
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**Credits** 16

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<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>
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**Credits** 16

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**Junior Year**

<table>
<thead>
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<th>Fall</th>
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<tbody>
<tr>
<td>GEOL 311 Geomorphology</td>
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</tr>
<tr>
<td>MATH 266 Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
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<tr>
<td>Approved Elective</td>
<td>3</td>
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<tr>
<td>Arts &amp; Humanities Elective</td>
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**Credits** 16

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<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>GEOL 487 Research</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 487 Research I 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.</td>
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</tr>
<tr>
<td>GEOL 487 Research I</td>
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**Credits** 16

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**Senior Year**

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<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>GEOL 421 Seminar I</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 487 Research I</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 487 Research I 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.</td>
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**Credits** 17

**Total Credits** 125

---

1 = Approved Geology Electives (must complete 2 courses from list) Geol 321 Geochimistry, Geol 414 Applied Geophysics, Geol 415 Intro to Paleontology, Geol 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 (geochimistry or paleontology, for example). The student should meet with their geology advisor early to map out their interests in their degree program.

**Mechanical Engineering**

#### B.S. in Mechanical Engineering

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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 165 Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Credits** 16

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[http://und.edu/academics/essential-studies/requirements.cfm](http://und.edu/academics/essential-studies/requirements.cfm)

**University of North Dakota**
Arts & Humanities or Social Science

ME 488

ME 370

Second Semester

ENGR 200

Composition II: Writing for Public Audiences

MATH 166

Calculus II

PHYS 251

University Physics I

Arts and Humanities

Credits

Second Semester

ENGR 200

Computer Applications in Engineering

ENGL 130

Composition II: Writing for Public Audiences

MATH 166

Calculus II

PHYS 251

University Physics I

Arts and Humanities

Credits

Sophomore Year

First Semester

ENGR 201

Statics

MATH 265

Calculus III

ME 201

Student Design

ME 341

Thermodynamics

PHYS 252

University Physics II

Arts and Humanities

Credits

Second Semester

ENGR 202

Dynamics

ENGR 206

Fundamentals of Electrical Engineering

ENGR 203

Mechanics of Materials

MATH 266

Elementary Differential Equations

PHYS 253

University Physics III

or CHEM 122

and CHEM 122L

Arts and Humanities

Credits

Junior Year

First Semester

ENGR 460

Engineering Economy

ME 301

Materials Science

ME 306

Fluid Mechanics

ME 322

Design of Machinery

Technical Elective

Credits

Second Semester

MATH 321

Applied Statistical Methods

ME 323

Machine Component Design

ME 323L

Machine Component Design Laboratory

ME 418

Manufacturing Processes

ME 474

Fundamentals of Heat and Mass Transfer

Technical Elective

Credits

Senior Year

First Semester

ME 480

Mechanical Engineering Seminar

ME 483

Mechanical Measurements Laboratory

ME 487

Engineering Design

Social Science

Technical Electives

Credits

Second Semester

ME 370

Engineering Disasters and Ethics

or CHE 340

or PHIL 250

or Professional Integrity in Engineering

or Ethics in Engineering and Science

ME 488

Engineering Design

Arts & Humanities or Social Science

Credits

Petsroleum Engineering

B.S. in Petroleum Engineering

Freshman Year

Fall

CHEM 121

General Chemistry I (ES = Q)

CHEM 121L

General Chemistry I Laboratory

ENGL 110

College Composition I

GEOE 203

Earth Dynamics

GEOE 101 may be substituted for this course if GeoE 203 is not offered.

GEOE 203L

Earth Dynamics Laboratory

ENGR 200

Computer Applications in Engineering

MATH 165

Calculus I

Credits

Spring

Essential Studies Arts and Humanities Elective (ES = G or U)

PTRE 201

Introduction to Petroleum Engineering

MATH 166

Calculus II

PHYS 251

University Physics I Including Lab

GEOE 301

Petrophysics

Credits

Sophomore Year

Fall

ENGR 201

Statics

CHEM 122

General Chemistry II

CHEM 122L

General Chemistry II Laboratory

MATH 265

Calculus III

PHYS 252

University Physics II Including Lab

ME 341

Thermodynamics

Credits

Spring

ME 306

Fluid Mechanics

PTRE 311

Petroleum Fluid Properties

ENGR 203

Mechanics of Materials

ENGL 130

Composition II: Writing for Public Audiences

PTRE 361

Petroleum Engineering Laboratory I

MATH 266

Elementary Differential Equations

Credits

Junior Year

Fall

Geology Elective

Essential Studies Arts & Humanities Elective (ES = G or U)

PTRE 401

Well Logging

PTRE 431

Reservoir Engineering

Credits
College of Nursing and Professional Disciplines

B.S. in Community Nutrition-Nutrition and Foods Option (p. 334)
B.S. in Community Nutrition-Nutrition and Society Option (p. 335)
B.S. in Dietetics (p. 334)
B.S. in Nursing (p. 333)
B.S. in Social Work (p. 336)

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
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<td></td>
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<td></td>
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</table>

Nursing

B.S. in Nursing

Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td></td>
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<tr>
<td>Spring</td>
<td></td>
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<tr>
<td>Geology Elective</td>
<td>3</td>
<td></td>
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<tr>
<td>Essential Studies Social Science Elective (ES = G or U)</td>
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<td></td>
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<tr>
<td>PTRE 411</td>
<td>Drilling Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHE 340</td>
<td>Professional Integrity in Engineering (ES = SS)</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 356</td>
<td>Geoscience Lectures</td>
<td>1</td>
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<tr>
<td>or COMM 110</td>
<td>or Statistical Applications in Geology</td>
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| Credits | 15 |

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>Fall</td>
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<td>16</td>
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<tr>
<td>Technical Elective</td>
<td>3</td>
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<tr>
<td>PTRE 421</td>
<td>Production Engineering</td>
<td>3</td>
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<tr>
<td>GEOE 455</td>
<td>Geomechanics II</td>
<td>3</td>
</tr>
<tr>
<td>PTRE 485</td>
<td>Senior Design (ES = A and C)</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 421</td>
<td>Seminar I (ES = O)</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 460</td>
<td>Engineering Economy (ES = SS)</td>
<td>3</td>
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| Credits | 16 |

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprise / Leadership Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Essential Studies Arts &amp; Humanities Elective (ES = G or U)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PTRE 441</td>
<td>Petroleum Evaluation &amp; Management</td>
<td>3</td>
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<tr>
<td>PTRE 485</td>
<td>Research Design (ES = O)</td>
<td>3</td>
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<tr>
<td>GEOL 422</td>
<td>Seminar II</td>
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<tr>
<td>PTRE 462</td>
<td>Petroleum Engineering Laboratory II</td>
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| Credits | 15 |

| Total Credits | 131 |

ES = represents courses satisfying the Essential Studies requirements of the University. 3rd Year Fall Semester Student Must Apply for Professional Degree Program. **Approved Courses for Geology Electives:** GeoE 323 Engr. Geology (4) / GeoE 417 Hydrogeology (3) / Geol 330 Structural Geology (3) / Geol 407 Petroleum Geology (3) / Geo 414 Applied Geophysics (3) / Geo 411 Sedimentology Strat. (5)**Approved Courses for Technical Electives:** Any geology electives may be used / CIEN 341. **Every student must fulfill all University, Departmental, and Essential Studies requirements. Essential Studies requirements are found at http://und.edu/academics/essential-studies/requirements.html#EnvironmentalEngr. (3) / GeoE 493 Special Topics in Geo. Engr. / PtE 493 Special Topic in Petroleum Engr: Managing Complex Systems (3), Intro to Hydraulic Fracturing (3), Exploration Methods in Petroleum Engr. (3), Fuels Technology (3) / PtE 461 Natural Gas Engr, (3)**Approved Courses for Entrepreneurship/Leadership Electives:** Lead 101 Intro to Leadership (3, ES=SS) / Engr 201 The Entrepreneur and the Enterprise (3) / Engr 410 Technology Venture (3)
Nutrition & Dietetics

B.S. in Community Nutrition-Nutrition and Foods Option

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tr>
<td>NUTR 240</td>
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<tr>
<td>PSYC 111</td>
<td>3</td>
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<tr>
<td>MATH 103</td>
<td>3</td>
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<tr>
<td>ENGL 110</td>
<td>3</td>
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<tr>
<td>CHEM 121</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 115</td>
<td></td>
</tr>
<tr>
<td>CHEM 121L</td>
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<tr>
<td>or CHEM 115L</td>
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Credits: 16

Spring

<table>
<thead>
<tr>
<th>Essential Studies Elective</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Focus on US Diversity course. Recommend SOC 110 however, any other US Diversity course is acceptable</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 100</td>
<td>1</td>
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<tr>
<td>CHEM 122L or CHEM 116L</td>
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<tr>
<td>ENGL 130</td>
<td>3</td>
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<tr>
<td>PSYC 250 or T&amp;L 252</td>
<td>3-4</td>
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<tr>
<td>CHEM 122 or CHEM 116</td>
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Credits: 16

Sophomore Year

Fall

| N&D 335         | 3       |
| RHS 200        | 3       |
| COMM 110       | 3       |
| Essential Studies Elective in Arts and Humanities | 3     |
| ANAT 204       | 3       |
| ANAT 204L      | 2       |

Credits: 14-15

Spring

| N&D 245 | Nutrition Throughout the Life Cycle | 3     |
| N&D 220 | Foodservice Safety and Sanitation  | 1     |
| CHEM 340| Survey of Organic Chemistry (If CHEM 115 and CHEM 116 was taken instead then do not have to take CHEM 340) | 4     |
| N&D 260 | Principles of Foods and Food Science | 5     |
| MRKT 201| Personal Marketing                 | 3     |
| CHEM 340L| Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L was taken instead then do not have to take CHEM 340L) | 1     |

Credits: 17

Junior Year

Fall

| Essential Studies Elective in Arts and Humanities | 3     |
| COMM 212 | Interpersonal Communication | 3     |
| MGMT 300 | Principles of Management (or N&D 340 and N&D 440) | 3-4   |
| PPT 301  | Human Physiology             | 4     |
| N&D 341  | Community Nutrition I        | 2     |

Credits: 15-16

Fall

| Elective | 4     |
| N&D 498  | Supervised Practice in Nutrition and Dietetics (Must have a 2.2 GPA, satisfactory completion of service learning requirements, and satisfactory completion of N&D 341 and 342. 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.) | 4     |
| N&D 494  | Research in Nutrition and Dietetics | 2     |
| Elective | 3     |
| Essential Studies Elective | 3     |

Credits: 16

Spring

| Electives | 15     |

Total Credits: 15-16

^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

Nutrition & Dietetics

B.S. in Dietetics

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
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<tr>
<td>PSYC 111</td>
<td>3</td>
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<tr>
<td>MATH 103</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>2</td>
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</table>

Credits: 17

Second Year

Fall

| N&D 220 | Foodservice Safety and Sanitation | 1     |
| CHEM 340| Survey of Organic Chemistry (If CHEM 115 and CHEM 116 was taken instead then do not have to take CHEM 340) | 4     |
| N&D 260 | Principles of Foods and Food Science | 5     |
| MRKT 201| Personal Marketing                 | 3     |
| CHEM 340L| Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L was taken instead then do not have to take CHEM 340L) | 1     |

Credits: 17

Spring

| N&D 245 | Nutrition Throughout the Life Cycle | 3     |
| N&D 220 | Foodservice Safety and Sanitation  | 1     |
| CHEM 340| Survey of Organic Chemistry (If CHEM 115 and CHEM 116 was taken instead then do not have to take CHEM 340) | 4     |
| N&D 260 | Principles of Foods and Food Science | 5     |
| MRKT 201| Personal Marketing                 | 3     |
| CHEM 340L| Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L was taken instead then do not have to take CHEM 340L) | 1     |

Credits: 17

Junior Year

Fall

| Essential Studies Elective in Arts and Humanities | 3     |
| COMM 212 | Interpersonal Communication | 3     |
| MGMT 300 | Principles of Management (or N&D 340 and N&D 440) | 3-4   |
| PPT 301  | Human Physiology             | 4     |
| N&D 341  | Community Nutrition I        | 2     |

Credits: 15-16

Fall

| Elective | 4     |
| N&D 498  | Supervised Practice in Nutrition and Dietetics (Must have a 2.2 GPA, satisfactory completion of service learning requirements, and satisfactory completion of N&D 341 and 342. 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.) | 4     |
| PPT 494  | Research in Nutrition and Dietetics | 2     |
| Elective | 3     |
| Essential Studies Elective | 3     |

Credits: 16

Spring

| Electives | 15     |

Total Credits: 15-16

^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

Nutrition & Dietetics

B.S. in Dietetics

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGL 110</td>
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<tr>
<td>PSYC 111</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>2</td>
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</tbody>
</table>

Credits: 17

Second Year

Fall

| N&D 220 | Foodservice Safety and Sanitation | 1     |
| CHEM 340| Survey of Organic Chemistry (If CHEM 115 and CHEM 116 was taken instead then do not have to take CHEM 340) | 4     |
| N&D 260 | Principles of Foods and Food Science | 5     |
| MRKT 201| Personal Marketing                 | 3     |
| CHEM 340L| Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L was taken instead then do not have to take CHEM 340L) | 1     |

Credits: 17

Spring

| N&D 245 | Nutrition Throughout the Life Cycle | 3     |
| N&D 220 | Foodservice Safety and Sanitation  | 1     |
| CHEM 340| Survey of Organic Chemistry (If CHEM 115 and CHEM 116 was taken instead then do not have to take CHEM 340) | 4     |
| N&D 260 | Principles of Foods and Food Science | 5     |
| MRKT 201| Personal Marketing                 | 3     |
| CHEM 340L| Survey of Organic Chemistry Laboratory (If CHEM 115L and CHEM 116L was taken instead then do not have to take CHEM 340L) | 1     |

Credits: 17

Junior Year

Fall

| Essential Studies Elective in Arts and Humanities | 3     |
| COMM 212 | Interpersonal Communication | 3     |
| MGMT 300 | Principles of Management (or N&D 340 and N&D 440) | 3-4   |
| PPT 301  | Human Physiology             | 4     |
| N&D 341  | Community Nutrition I        | 2     |

Credits: 15-16

Fall

| Elective | 4     |
| N&D 498  | Supervised Practice in Nutrition and Dietetics (Must have a 2.2 GPA, satisfactory completion of service learning requirements, and satisfactory completion of N&D 341 and 342. 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.) | 4     |
| N&D 494  | Research in Nutrition and Dietetics | 2     |
| Elective | 3     |
| Essential Studies Elective | 3     |

Credits: 16

Spring

| Electives | 15     |

Total Credits: 15-16

^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
University of North Dakota

B.S. in Community Nutrition-Nutrition and Dietetics

Freshman Year
Fall
NUTR 240 College Composition I 3
ENGL 110 College Composition I 3
CHEM 121 General Chemistry I 2
or CHEM 115 or Introductory Chemistry 3
CHEM 121L or CHEM 115L General Chemistry I Laboratory 1
MATH 103 College Algebra 3
PSYC 111 Introduction to Psychology 3

Credits 16

Spring
N&D 100 Introduction to Nutrition and Dietetics 1
CHEM 122 General Chemistry II 3
ANAT 204 Anatomy for Paramedical Personnel 2
CHEM 122L General Chemistry II Laboratory 1
ENGL 130 Composition II: Writing for Public Audiences 3
ANAT 204 Anatomy for Paramedical Personnel 3

Credits 19

Sophomore Year
Fall
PPT 301 Human Physiology 4
COMM 110 Fundamentals of Public Speaking 3
N&D 335 World Food Patterns 3
Essential Studies Elective 3

Credits 16

Spring
N&D 260 Principles of Foods and Food Science 5
N&D 245 Nutrition Throughout the Life Cycle 3
CHEM 340 Survey of Organic Chemistry 4
CHEM 340L Survey of Organic Chemistry Laboratory 1
N&D 220 Foodservice Safety and Sanitation 1
Essential Studies Elective 3
Application in February for fall semester admission to professional component

Credits 17

Junior Year
Summer
N&D 440 Foodservice Systems Management 2
N&D 498 Supervised Practice in Nutrition and Dietetics FSM Supervised Practice Experience in Foodservice Systems Management - 225 Clock Hours 5
SOC 326 or PSYC 241 Sociological Statistics or Introduction to Statistics 3-4

Credits 10-11

Fall
N&D 341 Community Nutrition I 2
N&D 350 Medical Nutrition Therapy I 2
N&D 498 Supervised Practice in Nutrition and Dietetics MNTI Supervised Practice in Medical Nutrition Therapy I - 90 Clock Hours 2
MGMT 300 Principles of Management 3
N&D 340 Foodservice Systems Production 2
N&D 498 Supervised Practice in Nutrition and Dietetics FSP Supervised Practice in Foodservice Systems Production - 90 Clock Hours 2

Credits 13

Spring
N&D 441 Advanced Nutrition 4
N&D 342 Community Nutrition II 2
N&D 498 Supervised Practice in Nutrition and Dietetics Dietetic Supervised Practice in Community Nutrition - 180 Clock Hours 4
BMB 301 Biochemistry 3

Credits 13

Senior Year
Fall
N&D 480 Interprofessional Health Care 1
N&D 450 Medical Nutrition Therapy II 3
N&D 498 Supervised Practice in Nutrition and Dietetics MNT Supervised Practice Experience in Medical Nutrition Therapy II - 270 Clock Hours 6
N&D 494 Research in Nutrition and Dietetics 2

Credits 12

Spring
N&D 498 Supervised Practice in Nutrition and Dietetics Supervised Practice Experience (Two 5-week rotations or One 10-week rotation) - 400 Clock Hours 9
N&D 330 Resources for Dietetic Practice 2

Credits 11

Total Credits 127-128

**^ 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

Nutrition & Dietetics

B.S. in Community Nutrition-Nutrition and Dietetics

Freshman Year
Fall
NUTR 240 College Composition I 3
ENGL 110 College Composition I 3
CHEM 121 General Chemistry I 2
or CHEM 115 or Introductory Chemistry 3
CHEM 121L or CHEM 115L General Chemistry I Laboratory 1
MATH 103 College Algebra 3
PSYC 111 Introduction to Psychology 3

Credits 16

Spring
Essential Studies Elective in Arts and Humanities 3
N&D 100 Introduction to Nutrition and Dietetics 1
ENGL 130 Composition II: Writing for Public Audiences 3
PSYC 250 or T&L 252 Developmental Psychology or Child Development 3-4
CHEM 122 General Chemistry II 3
or CHEM 116 or Introduction to Organic and Biochemistry 3
CHEM 122L or CHEM 116L General Chemistry II Laboratory 1
or Introduction to Organic and Biochemistry Laboratory 1
Essential Studies Elective Focus on US Diversity course. Recommend SOC 110 3
however, any other US Diversity course is acceptable

Credits 17-18

Sophomore Year
Fall
RHS 200 Helping Skills in Community Services 3
ANAT 204 Anatomy for Paramedical Personnel 3
Elective 3
ANAT 204L Anatomy for Paramedical Personnel Laboratory 2
COMM 110 Fundamentals of Public Speaking 3
N&D 335 World Food Patterns 3

Credits 17

Spring
N&D 220 Foodservice Safety and Sanitation 1

Credits 1
### Social Work

#### B.S. in Social Work

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110 College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 111 Introduction to Psychology</td>
<td>3</td>
</tr>
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</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
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<tbody>
<tr>
<td>SOC 110 Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111 Concepts of Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111L Concepts of Biology Laboratory</td>
<td>1</td>
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</table>

| Credits                        | 13      |

**Fall**

<table>
<thead>
<tr>
<th>Junior Year</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>N&amp;D 341 Community Nutrition I</td>
<td>2</td>
</tr>
<tr>
<td>PPT 301 Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies Elective in Arts and Humanities</td>
<td>3</td>
</tr>
<tr>
<td>COMM 212 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>SOC 335 The Family</td>
<td>3</td>
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| Credits                        | 15      |

**Spring**

<table>
<thead>
<tr>
<th>Senior Year</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>N&amp;D 494 Research in Nutrition and Dietetics</td>
<td>2</td>
</tr>
<tr>
<td>Electives</td>
<td>11</td>
</tr>
<tr>
<td>N&amp;D 498 Supervised Practice in Nutrition and Dietetics</td>
<td>4</td>
</tr>
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</table>

| Credits                        | 14-16    |

**Spring**

<table>
<thead>
<tr>
<th>B.S. in Social Work</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>N&amp;D 348 or KIN 327 Sports Nutrition</td>
<td>2-3</td>
</tr>
<tr>
<td>or SOC 352 Aging</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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</table>

| Credits                        | 14-15    |

**Total Credits**

| 125-129                        |          |

**Second Semester**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>SWK 442 Social Policy</td>
<td>3</td>
</tr>
<tr>
<td>SWK 454 Generalist Social Work Practice with Communities</td>
<td>3</td>
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</table>

| Credits                        | 17      |

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>SWK 317 Social Work Research</td>
<td>3</td>
</tr>
<tr>
<td>SWK 311 Child Welfare (Or any Social Work Elective)</td>
<td>3</td>
</tr>
<tr>
<td>SWK 357 Human Behavior and the Social Environment II</td>
<td>3</td>
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<tr>
<td>CJ 201 Introduction to Criminal Justice (Or any Advanced Social Science Course)</td>
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</table>

| Credits                        | 18      |

**Second Semester**

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>SWK 424 Generalist Social Work Practice with Individuals and Families</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>SOC 253 Juvenile Delinquency (Or any Advanced Social Science Course)</td>
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</table>

| Credits                        | 18      |

| Credits                        | 15      |

**Second Semester**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
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</thead>
<tbody>
<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                        | 11      |

**Spring**

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>N&amp;D 348 or KIN 327 Sports Nutrition</td>
<td>2-3</td>
</tr>
<tr>
<td>or SOC 352 Aging</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits                        | 14-15    |

**Spring**

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
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<tbody>
<tr>
<td>N&amp;D 348 or KIN 327 Sports Nutrition</td>
<td>2-3</td>
</tr>
<tr>
<td>or SOC 352 Aging</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits                        | 14-15    |

**Second Semester**

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>SWK 442 Social Policy</td>
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</tr>
<tr>
<td>SWK 454 Generalist Social Work Practice with Communities and Organizations</td>
<td>3</td>
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</table>

| Credits                        | 11      |

**Fall**

<table>
<thead>
<tr>
<th>Fall</th>
<th></th>
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<tbody>
<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                        | 17      |
John D. Odegard School of Aerospace Sciences

B.S. in Aeronautics (p. 337)

B.S. in Atmospheric Sciences (p. 337)

B.S. in Computer Science (http://und-public.courseleaf.com/4yearplan/aerospaceciences/computerscience)

Atmospheric Sciences

B.S. in Atmospheric Sciences

Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 100</td>
<td>1</td>
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<tr>
<td>ATSC 110</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L</td>
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</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
<tr>
<td>MATH 165</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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</table>

| Credits | 16 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 166</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 130</td>
<td>4</td>
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<tr>
<td>ENGL 130</td>
<td>3</td>
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<tr>
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<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td>2</td>
</tr>
</tbody>
</table>

| Credits | 16 |

Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 210</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>4</td>
</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
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</table>

| Credits | 15 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 240</td>
<td>4</td>
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<tr>
<td>ATSC 270</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L</td>
<td>1</td>
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</tbody>
</table>

| Credits | 15 |

Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 345</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 350</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 250</td>
<td>3</td>
</tr>
<tr>
<td>*Career Electives</td>
<td>4</td>
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</tbody>
</table>

| Credits | 16 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 353</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 360</td>
<td>4</td>
</tr>
<tr>
<td>MATH 321</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 210</td>
<td>or Introduction to Business and Economic Statistics</td>
</tr>
<tr>
<td>Essential Studies</td>
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</table>

| Credits | 16 |

Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATSC 405</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 411</td>
<td>4</td>
</tr>
<tr>
<td>ATSC 492</td>
<td>1</td>
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<tr>
<td>*Career Electives</td>
<td>4</td>
</tr>
<tr>
<td>**Free Electives</td>
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</tr>
<tr>
<td>Essential Studies</td>
<td>3</td>
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</tbody>
</table>

| Credits | 16 |

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 460</td>
<td>4</td>
</tr>
<tr>
<td>ATSC 492</td>
<td>2</td>
</tr>
<tr>
<td>*Career Electives</td>
<td>4</td>
</tr>
<tr>
<td>Free Electives</td>
<td>5</td>
</tr>
</tbody>
</table>

| 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. 337)

B.S. in Aeronautics with a Major in Aviation Technology Management (p. 338)

B.S. in Aeronautics with a Major in Commercial Aviation (p. 339)

B.S. in Aeronautics with a Major in Flight Education (p. 339)

B.S. in Aeronautics with a Major in Unmanned Aircraft Systems (p. 340)

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</td>
<td>5</td>
</tr>
<tr>
<td>AVIT 260</td>
<td>4</td>
</tr>
<tr>
<td>COMM 110</td>
<td>3</td>
</tr>
</tbody>
</table>

| Credits | 15 |
### Essential Studies: Math/Sci/Tech

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 110</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 110L</td>
<td>1</td>
</tr>
<tr>
<td>MATH 103</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>3</td>
</tr>
</tbody>
</table>

### Credits
- 14

### Fall
- **AVIT 100** Aviation Orientation 1
- **AVIT 103** Introduction to Air Traffic Control 2
- **ATSC 110** Meteorology I 3
- **ATSC 110L** Meteorology I Laboratory 1
- **MATH 103** College Algebra 3
- **ENGL 110** College Composition I 3

### Credits
- 16

### Sophomore Year

#### Spring
- **AVIT 208** Aviation Safety 3
- **AVIT 363** Air Traffic Control: Radar Operations II 4
- **COMM 212** Interpersonal Communication 3

### Credits
- 16

#### Fall
- **ENGL 130** Composition II: Writing for Public Audiences 3
- **AVIT 250** Human Factors 2
- **AVIT 261** Air Traffic Control: Radar Operations I 4

### Credits
- 15

### Junior Year

#### Spring
- **AVIT 402** Airport Planning and Administration 3
- **AVIT 464** Air Traffic Control: Tower and Radar Operations III 4
- **MGMT 300** Principles of Management 3
- or **AVIT 311** Safety Management Systems
- or **AVIT 312** Aircraft Accident Invest.

### Credits
- 17

#### Fall
- **AVIT 362** Air Traffic Control: Advanced Tower Operations II 4
- **ISBC 320** Professional Communication for Business 3
- or **ENGL 227** Intro to Lit. and Culture
- or **ENGL 228** Diversity in Global Lit.
- or **ENGL 229** Diversity in U.S. Lit.
- or **ENGL 308** Art of Writing Nonfiction

### Credits
- 16

#### Senior Year

#### Spring
- **AVIT 465** Air Traffic Control: Radar and Tower Operations IV 4
- **AVIT 485** Aviation Senior Capstone 3

### Credits
- 16

#### Fall
- **AVIT 403** Aerospace Law 3
- **AVIT 468** Air Traffic Control: Non-Radar Procedures 4

### 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

### B.S. in Aeronautics with a Major in Aviation Technology Management

#### Freshman Year

#### Fall
- **AVIT 100** Aviation Orientation 1
- **ATSC 110** Meteorology I 3
- **ATSC 110L** Meteorology I Laboratory 1
- **MATH 103** College Algebra 3
- **COMM 110** Fundamentals of Public Speaking 3

### Credits
- 15

#### Spring
- **AVIT 102** Introduction to Aviation 5
- or **AVIT 142** and **AVIT 143**
- **AVIT 103** Introduction to Air Traffic Control 2
- **ENGL 110** College Composition I 3
- **AVIT 250** Human Factors 2
- **AVIT 261** Air Traffic Control: Radar Operations I 4

### Credits
- 15

### Sophomore Year

#### Fall
- **AVIT 208** Aviation Safety 3
- **AVIT 250** Human Factors 2
- **AVIT 261** Air Traffic Control: Radar Operations I 4

### Credits
- 16

#### Spring
- **AVIT 402** Airport Planning and Administration 3
- **AVIT 403** Aerospace Law 3
- **Program Electives** 6

### Credits
- 15

#### Junior Year

#### Fall
- **AVIT 402** Airport Planning and Administration 3
- **AVIT 405** or **AVIT 407**
- **AVIT 403** Aerospace Law 3

### Credits
- 18

#### Spring
- **AVIT 402** Airport Planning and Administration 3
- **Program Electives** 6

### Credits
- 15
### 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</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>
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<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
</tr>
<tr>
<td>Social Science Essential Studies Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Second Semester

| Social Science Essential Studies Elective | 3 |
| AVIT 221       | Basic Attitude Instrument Flying | 3 |
| AVIT 208       | Aviation Safety               | 3 |
| AVIT 103       | Introduction to Air Traffic Control | 2 |
| MATH 146       | Applied Calculus I            | 3 |
| Elective Course | 3 |

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 325</td>
<td>Instrument Flight Instructor</td>
</tr>
<tr>
<td>AVIT 421</td>
<td>Advanced Aerodynamics</td>
</tr>
<tr>
<td>AVIT 428</td>
<td>Transport Category Aircraft Systems</td>
</tr>
<tr>
<td>AVIT 430</td>
<td>Crew Resource Management</td>
</tr>
<tr>
<td>AVIT 402</td>
<td>Airport Planning and Administration</td>
</tr>
<tr>
<td>or AVIT 405 or AVIT 407</td>
<td>or General Aviation Operations and Management</td>
</tr>
</tbody>
</table>

#### Second Semester

| Credits | 17 |

#### Total Credits | 125 |

### B.S. in Aeronautics with a Major in Flight Education

#### Freshman Year

<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>3</td>
</tr>
</tbody>
</table>

#### Fall

| AVIT 100 | Aviation Orientation | 1 |

#### Credits | 17 |
AVIT 102  Introduction to Aviation  5
ATSC 110  Meteorology I  3
ATSC 110L  Meteorology I Laboratory  1
ENGL 110  College Composition I  3
Essential Studies: Social Science  3

Credits  16

Sophomore Year

Spring
AVIT 323  Aerodynamics - Airplanes  3
AVIT 324  Aircraft Systems  3
AVIT 309  Flight Physiology  3
COMM 110  Fundamentals of Public Speaking  3
Essential Studies: Social Science  3

Essential Studies: Fine Arts  3
Free Electives  2

Credits  15

Fall
AVIT 222  IFR Regulations and Procedures  3
AVIT 250  Human Factors  2
ENGL 130  Composition II: Writing for Public Audiences  3
Essential Studies: Humanities  3

Essential Studies: Fine Arts OR Humanities  3

Credits  15

Junior Year

Spring
AVIT 414  Certified Flight Instructor Certification  5
AVIT 405  Airline Operations and Management  3
Essential Studies: Fine Arts or Humanities  3
ENGL 227  Introduction to Literature and Culture  3
or ENGL 228-Diversity in Global Lit.  3
or ENGL 229-Diversity in U.S. Lit.  3
or ENGL 309-Modern Grammar  3
or ISBC-Prof Comm for Bus.  3

Free Electives  2

Credits  16

Fall
AVIT 325  Multi-Engine Systems and Procedures  2
AVIT 403  Aerospace Law  3
T&L 250  Introduction to Education  3

Essential Studies: Social Science  3

Credits  15

Senior Year

Spring
AVIT 416  Multi-Engine Flight Instructor  2
AVIT 485  Aviation Senior Capstone  3
AVIT 491  Methods and Materials in Teaching Aviation II  2

Free Electives  7

Credits  14

Fall
AVIT 407  General Aviation Operations and Management  3
AVIT 415  Instrument Flight Instructor  4
AVIT 490  Methods and Materials in Teaching Aviation I  2
T&L 345  Curriculum Development and Instruction  3

Free Electives  2

Credits  14

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. in Aeronautics with a Major in Unmanned Aircraft Systems

Freshman Year

Spring
AVIT 221  Basic Attitude Instrument Flying  3
AVIT 208  Aviation Safety  3
AVIT 103  Introduction to Air Traffic Control  2
MATH 146  Applied Calculus I  3
or highest eligible  3

Essential Studies: Social Science  3

Electives  2

Credits  16

Fall
AVIT 100  Aviation Orientation  1
AVIT 102  Introduction to Aviation  5
AVIT 126  Introduction to UAS Operations  2
ATSC 110  Meteorology I  3
ATSC 110L  Meteorology I Laboratory  1
ENGL 110  College Composition I  3

Credits  15

Sophomore Year

Spring
AVIT 323  Aerodynamics - Airplanes  3
AVIT 324  Aircraft Systems  3
COMM 110  Fundamentals of Public Speaking  3
Essential Studies: Fine Arts or Humanities  3

Credits  15

Fall
AVIT 222  IFR Regulations and Procedures  3
AVIT 250  Human Factors  2
ENGL 130  Composition II: Writing for Public Audiences  3
CSCI 130  Introduction to Scientific Programming  4
or CSCI 160-Computer Science I  4
Essential Studies: Humanities  3

Credits  15

Junior Year

Spring
AVIT 333  UAS Remote Sensing  4
ATSC 231  Aviation Meteorology  4
Essential Studies: Social Science  3

Electives  6

Credits  17

Fall
AVIT 325  Multi-Engine Systems and Procedures  2
AVIT 327  Gas Turbine Engines  2
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.  3
or ENGL 229-Diversity in U.S. Lit.  3
or ENGL 308-Art of Writing Nonfiction  3
or ISBC 320-Prof Comm for Business  3

Credits  16

Senior Year

Spring
AVIT 430  Crew Resource Management  3
AVIT 485  Aviation Senior Capstone  3

Electives  9

Credits  15
**Computer Science**

**B.S. in Computer Science**

**Freshman Year**

**Fall**
- CSCI 160 Computer Science I 4
- MATH 107 Pre-calculus 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**
- 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 155 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 345 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

-- 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

**School of Medicine and Health Sciences**

**B.S. in Athletic Training** (p. 341)

**B.S. in Medical Laboratory Science** (p. 342)

**Athletic Training (Family Medicine)**

**B.S. in Athletic Training**

**Freshman Year**

**Fall**
- BIOL 150 General Biology I(Must be taken in fall semester) 3
- MED 205 Medical Terminology 1
- FMED 101 Orientation to Athletic Training(Must be taken in fall semester) 1
- BIOL 150L General Biology I Laboratory(Must be taken in fall semester) 1
- ENGL 130 College Composition I 3
- PSYC 111 Introduction to Psychology 3
- MATH 103 College Algebra(or tested out on math placement exam/ACT score) 3

**Credits** 15

**Spring**
- KIN 110 First Aid and CPR 1
- CHEM 121 General Chemistry I 3
- CHEM 121L General Chemistry I Laboratory 1
- ENGL 130 Composition II: Writing for Public Audiences 3
- FMED 207 Prevention and Care of Athletic Injuries 2
- FMED 207L Laboratory Prevention and Care of Athletic Injuries 1
- Essential Studies 3

Only admitted students will be allowed to proceed beyond freshman year. The admission is a competitive process and the minimum standards for application are listed in the academic catalog.

**Credits** 14

**Sophomore Year**

**Fall**
- ANAT 204 Anatomy for Paramedical Personnel 3
- FMED 205 Anatomy for Athletic Trainers 2
- FMED 208 Procedures in Athletic Training 1
- FMED 208L Laboratory Procedures in Athletic Training 1

**Credits** 14
FMED 211  Beginning Clinical Practicum I in Athletic Training 1
SOC 110  Introduction to Sociology 3
PSYC 250  Developmental Psychology 4
PHYS 161  Introductory College Physics I 4

**Credits** 19

**Spring**
PSYC 241  Introduction to Statistics 4
PHYS 162  Introductory College Physics II 4
COMM 110  Fundamentals of Public Speaking 3
FMED 213  Beginning Clinical Practicum in Athletic Training 1
FMED 200  Understanding Medicine 3

**Junior Year**

**Fall**
FMED 481  Athletic Injury Assessment 4
FMED 311  Intermediate Clinical Practicum I in Athletic Training 2
KIN 332  Biomechanics 3
KIN 332L Biomechanics Laboratory 1
PPT 301  Human Physiology 4

**Essential Studies** 3

**Credits** 15

**Spring**
FMED 313  Intermediate Clinical Practicum II in Athletic Training 2
FMED 320  Athletic Training Modalities 2
FMED 320L Laboratory Athletic Training Modalities 1
FMED 321  Athletic Training Rehabilitation Techniques 2
FMED 321L Laboratory Athletic Injury Rehabilitation 1
NUTR 240  Human Nutrition 3

**Essential Studies** 6

**Credits** 17

**Senior Year**

**Fall**
KIN 402L Exercise Physiology Laboratory 1
KIN 402  Exercise Physiology 3
FMED 491  Seminar in Athletic Training 2
FMED 411  Advanced Clinical Practicum I in Athletic Training 2
FMED 497  Internship in Athletic Training 3
FMED 312  Medical Aspects of Sports 2

**Essential Studies** 4

**Credits** 17

**Spring**
FMED 343  Organizational Administration of Athletic Training 3
FMED 413  Advanced Clinical Practicum II in Athletic Training 2
PPT 320  Pharmacology in Sport 2
FMED 491  Seminar in Athletic Training 2

**Essential Studies** 7

**Credits** 16

**Total Credits** 130

Admission to the professional program is competitive. Minimum standards are listed in the Academic catalog. **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>MLS 477L</td>
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<td>MLS 478</td>
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<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
Graduate Academic Information

School of Graduate Studies Information (p. 344)
Admissions Policies and Procedures (p. 345)
Degrees and Degree Requirements (p. 357)
Research (p. 353)
Academic Grievances (p. 358)
Graduate Programs and Courses (p. 361)

The School of Graduate Studies
Wayne Swisher, 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. 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 National Association of Graduate Admissions Professionals, 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 (M.S.A.E.), Business Administration (M.B.A.), Public Administration (M.P.A.), and Technology (M.S.)
- College of Engineering and Mines: Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Geological Engineering, Geology, Mechanical Engineering, and Sustainable Engineering
- College of Nursing and Professional Disciplines: Advanced Public Health Nursing, Nurse Anesthesia, Adult Gerontological NP and CNS, Family Nurse Practitioner, Nurse Educator, Nutrition and Dietetics, Psych/Mental Health NP and CNS, and Social Work
- School of Medicine and Health Sciences: Anatomy & Cell Biology, Biochemistry & Molecular Biology, Pharmacology, Physiology, and Therapeutics, Medical Lab Science, Microbiology & Immunology, Occupational Therapy (M.O.T), Physical Therapy (D.P.T.), Physician Assistant Studies (M.P.A.S.), Public Health (M.P.H)

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. The Associate Dean of the School of Graduate Studies reports directly to the Dean and is primarily responsible for all aspects of School of Graduate Studies Assessment. 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.

Student Responsibility
It is the responsibility of the student to become informed and to observe all regulations and procedures required by the University, the School of Graduate Studies Catalog and the program in which she or he is enrolled. The student is responsible for reading the Graduate Catalog, all contracts for employment, the terms and conditions of any awards and correspondence from the various offices of the University. The student is responsible for knowing his or her academic standing and grade-point average. While the School of Graduate Studies attempts to notify students regarding any problems in the student’s progress toward a degree, the student alone is responsible for maintaining satisfactory academic standing and progress.

The School of Graduate Studies expects all students and faculty to be aware of its policies and procedures. Ignorance of a rule does not constitute a basis for waiving that rule.

Petitions and Appeals
Students who wish to be excused from School of Graduate Studies requirements must petition the Dean on a petition form available on the School of Graduate Studies Web page. The forms require the written endorsement of the advisor, instructor (if appropriate), and department chairperson or graduate program director. The student should state clearly and concisely: 1) the nature of the petition; 2) the basis for the petition, including any supporting documentation; and 3) the outcome they are seeking. Petitions should be used only for exceptional circumstances. Failure to follow policies and procedures usually does not qualify as an exceptional circumstance. Graduate students or members of the Graduate Faculty may appeal decisions of the dean to the Graduate Committee.

Prohibited Acts
Section 2-3 of the UND Code of Student Life defines prohibited acts as those that would include violation of civil or criminal laws, acts of dishonesty, acts against other persons, disruptive activity or disorderly conduct, possession of prohibited property, acts involving property, and misuse of the campus judicial system. Graduate students involved in any prohibited activities will be subject to University discipline sanctions.

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 58202-8178, Telephone (701) 777-2784; or 1-800-CALL-UND, or email at: gradschool@mail.und.edu.

Admissions Policies and Procedures
Application for Admission
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.
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 minimum of 20 semester credits of appropriate undergraduate coursework in the chosen field.

3. 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). (Applicants having the equivalent of one or more years of baccalaureate work reported on a non-graded system must submit an evaluation of the work and Graduate Record Examination scores on the General Test and the Subject Test, if offered in the discipline.)

4. 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.

5. 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 79 is required. To be considered for a Graduate Teaching Assistantship, a score of 26/30 on the TOEFL Speaking subtest is required.
   d. Successful completion of English Language Service (ELS) Language Center’s Intensive Level 112. Graduate Teaching Assistants must be proficient English language communicators. International students who are nonnative speakers of English are required to take the TSE (Test of Spoken English) or the SPEAK test and achieve a score of 50 before a Graduate Teaching Assistantship may be offered. Language proficiency may also be established on the basis of the Internet Based TOEFL (iBT) if the student scores at least 26 on the spoken section and meets all other requirements. Contact the School of Graduate Studies for more information.

The programs below require additional and/or higher scores on the TOEFL test to be considered for admission.

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<th>Program</th>
<th>IBT</th>
<th>Listening</th>
<th>Writing</th>
<th>Reading</th>
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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.

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.

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 (statements, goals, essays, etc.) and letters of recommendation are written to a specific program, an applicant must provide new written statements and letters of recommendation for each application. Because test scores have expiration dates, a test score must be considered current by the testing agency in order to be used for an application. An applicant may change the program, degree, and/or admit term of a submitted application once, but not after an admission decision has been published regarding the application.

Applications for which we have not received all of the required application materials and have a status of incomplete at the official 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 or program 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 QUALIFIED, PROVISIONAL, or DEFERRED admission status.

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. Faculty members from individual departments may have additional requirements. The various categories of admission are detailed in the following paragraphs.

Approved Status

Applicants who have met the minimum admission requirements stipulated by the School of Graduate Studies and have met all departmental requirements for admission may be admitted into Approved status. Admission to this status implies only that a student is permitted to commence graduate work which normally will lead to a degree, diploma, or certificate. However, admission to Approved status does not guarantee that a student will be allowed to become a candidate for a degree or diploma.

Qualified Status

Admission to Qualified status may be granted to applicants who have met all minimum admission requirements except for prerequisite coursework or an official test score required for admission. Generally, students will not be admitted into qualified status with more than nine (9) credits of outstanding prerequisites. Upon completion of the conditions placed on the admission, and provided the student has earned a GPA of at least 3.00 for all work attempted, she/he is eligible to be advanced to Approved status. A student in Qualified status may be dismissed after one registration if her/his GPA is below 3.00, or if she/he fails to meet the specified conditions of admission.

Provisional Status

Admission to Provisional 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. 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. Ordinarily, students in Provisional status are not eligible for graduate teaching, research, or service assistantships or for School of Graduate Studies tuition waivers. Exceptions must be approved by the Dean of the School of Graduate Studies.

Conditional Status

Admission to Conditional status may be granted to an applicant who has not met the English Language Proficiency requirement set by the School of Graduate Studies and is enrolled in or will be enrolling in the ELS Language Centers Intensive English Program. Students admitted under conditional status will not be allowed to enroll in courses until after they have passed the ELS Language Center’s Intensive Level 112.

Non-Degree Status

Applicants who wish to enroll in graduate level classes as a non-degree seeking student should seek admission into Non-Degree status. All applicants for non-degree status must have met the English Language Proficiency Requirement, and have a recognized baccalaureate degree. Permission of the academic department will be required to enroll in a class as a non-degree student. Therefore, the applicant should consult with the department(s) offering the courses before completing an application. Subject to the approval of the department and the Dean of the School of Graduate Studies, a maximum of nine (9) semester credits taken as a graduate Non-Degree student may subsequently be counted toward a graduate degree subject to all other regulations. Non-degree students are not eligible for graduate teaching, research, or service assistantships or School of Graduate Studies tuition waivers.

Post-Baccalaureate Status

The purpose of this status is to provide a procedure for individuals to take a limited amount of academic work for cultural, intellectual, continuing education needs, or with the intent to complete prerequisite coursework for an eventual application to a graduate program. A student registered in Post-Baccalaureate status may not change to another status until the completion of the term. Students in Post-Baccalaureate status are not eligible for graduate teaching, research, or service assistantships or School of Graduate Studies tuition waivers.

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 to audit classes or to take courses for credit are made through the School of Graduate Studies and/or Registrar’s Office. (Reference: UND Faculty Handbook)

Eligibility for Faculty to Pursue an Advanced Degree

Eligibility for Faculty to Pursue 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.

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 Dean.
of the School of Graduate Studies. There is no guarantee that students denied delayed matriculation will be offered admission at a later date.

**Matriculation Requirement**

Students who do not enroll in program specific coursework as specified in the admission letter the semester that they are admitted, and do not gain approval to delay or move their matriculation, will have their admission offer rescinded. In such instances, a new application for future enrollment will need to be submitted with no guarantee that the application will result in another offer of admission. Academic departments may petition the Dean of the School of Graduate Studies for exceptions to this policy.

**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-baccalaurate 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 World Education Services transcript evaluation in addition to official transcripts from their university.

Admission to a doctoral program may require a master’s degree. Please consult with the School of Graduate Studies (p. 612) for current information on doctoral program admission requirements.

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. This requirement can be met by submitting scores from the Test of English as a Foreign Language (TOEFL), or scores from the IELTS, or through successful completion of the English Language Service (ELS) Center’s Intensive Language 112.

Graduate teaching assistantships are generally unavailable to international students during their first year of study. However, an applicant with an outstanding record may be considered only if he or she has first taken the Test of Spoken English or the SPEAK test and achieves a minimum score of 50 or scored 26/30 on the speaking portion of the TOEFL IBT, or an overall band score on the IELTS of at least 6.5.

International students are required to submit a certification of finances to the School of Graduate Studies after an offer of admission has been made. Approximately $30,000 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 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. 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.

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. Students may be placed on probation with conditions or dismissed as a result of unsatisfactory academic performance or progress. Dismissal will be noted on the student’s transcript.

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.Eng.) 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.Eng.), the student will be dismissed.

No decision on dismissal will be reached until a minimum of 9 graduate credits has been accumulated.

**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 Code</th>
<th>Course Name</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>
<tr>
<td>UNIV 994</td>
<td>Professional Internship</td>
<td>1</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, (i.e., 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.

After two regular semesters of 6 to 9 credits in 996 for master’s students and after four regular semesters for doctoral students, a student wishing to enroll in additional 996 credits will be required to petition the School of Graduate Studies Dean.

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.

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 designee, 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.

Doctor of Philosophy and Doctor of Education students will select four of the five committee members for the Faculty Advisory Committee. The Dean of the School of Graduate Studies will select the fifth committee member who will serve as the Member-at-Large. The member-at-large serves as a representative of the School of Graduate Studies and thus has the added responsibility of ensuring that the policies and procedures of the School of Graduate Studies are being followed.

Doctoral students in the Department of Teaching and Learning are allowed to have only four members on their committee, three members may be from within the student’s department and the fourth member serves as the member-at-large.

Doctor of Arts students have the option of a three or five member committee. For five member committees, the students will select four of the five committee members for the Faculty Advisory Committee. The Dean of the School of Graduate Studies will select the fifth committee member who will serve as the Member-at-Large. The member-at-large serves as a representative of the School of Graduate Studies and thus has the added responsibility of ensuring that the policies and procedures of the School of Graduate Studies are being followed.

Financial Information

Assistantship and Award Policies and Procedures

Applications for Graduate Assistantships are accepted throughout the year; however, students are reminded that most appointments for the Fall semester are offered by April 15. 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 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.

Acceptance of an offer of a graduate scholarship, fellowship, traineeship, or graduate assistantship for the next academic year completes an agreement which both the student and the School of Graduate Studies expect to honor. In those instances in which the student indicates acceptance and subsequently desires to change plans, a written resignation of the appointment may be submitted at any time through April 15 in order to accept another scholarship, fellowship, traineeship, or graduate assistantship. However, an acceptance given or left in force after April 15 commits the student to the appointment.

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. Most assistantships are half-time assistantships which require 20 hours of work per week and permit the student to 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 School of Graduate Studies 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. Students are responsible for any tuition not covered by the waiver and all other fees. 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. A health insurance plan is also available. Graduate Teaching Assistantships are available in many departments offering a graduate degree.

Graduate Teaching Assistants must be proficient English language communicators. International students who are nonnative speakers of English are required to take the TSE (Test of Spoken English) or the SPEAK test and achieve a score of 50 before a Graduate Teaching Assistantship may be offered. Language proficiency may also be established on the basis of the Internet Based TOEFL (iBT) if the student scores at least 26 on the spoken section and meets all other section requirements, or an overall band score on the IELTS of at least 6.5. Contact the School of Graduate Studies for more information.

Graduate Research Assistantships
Graduate Research Assistantships are offered in many of the departments of the University. These appointments usually carry a monthly stipend. The purpose of research assistantships is to provide degree-seeking students with research experience in their academic disciplines while assisting with an ongoing research project. Half-time and quarter-time assistants must carry a minimum of six credits per semester (3 for summer). Graduate Research Assistants may be eligible for a School of Graduate Studies 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. Students are responsible for any tuition not covered by the waiver and all other fees. 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. A health insurance plan is also available. 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, including but not limited to, the Division of Student Affairs, ITSS, and Athletic Department, and in many departments offering graduate degrees. 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 School of Graduate Studies 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. Students are responsible for any tuition not covered by the waiver and all other fees. 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. A health insurance plan is also available. Graduate Research Assistantships are available in many departments offering a graduate degree.

Doctoral Student Conference Travel Support: The School of Graduate Studies provides travel support of up to $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 any tuition not covered by the waiver and all other fees. 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. Benefitted employees of UND are not eligible for School of Graduate Studies tuition waivers. The following policy applies to all School of Graduate Studies 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.
- The dollar amount of the tuition waivers awarded will be based on credit hour equivalents and may reflect a fraction of total tuition. (Dollar amount waived = credit hours x tuition rate by residency)
- 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 major, extending the time to complete the degree, or changing the number of credits in the Program of Study may result in the loss of all currently awarded tuition waivers.
- In any one semester, the maximum dollar value of tuition waiver may not exceed one-fourth of the total tuition billed.
- Only students in “Approved” or “Qualified” status are eligible for tuition waivers. Continuing enrollment (996) 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 Graduate School receives notice that the student would like to decline the offer.

Questions regarding the tuition waiver policy should be emailed to questions@gradschool.und.edu.

Cultural Diversity Tuition Waivers may be available. Applications are available in the School of Graduate Studies or 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>Letter Grade</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>
<tr>
<td>C</td>
<td>(Acceptable)</td>
<td>2 Honor Points</td>
</tr>
<tr>
<td>D</td>
<td>(Passing, but no graduate credit awarded)</td>
<td>1 Honor Point</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0 Honor Points</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>SP</td>
<td>Satisfactory Progress</td>
<td>(995,997,998 &amp; 999)</td>
</tr>
<tr>
<td>UP</td>
<td>Unsatisfactory Progress</td>
<td>(995,997,998 &amp; 999)</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.

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.
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 Catalog. Graduate level courses outside of a student’s major program are eligible for use in the major or minor of any Program of Study for a Graduate Degree, subject to the approval of the student’s advisor or Faculty Advisory Committee and the Dean of the School of Graduate Studies. All UND courses numbered 300 and above may be applied to the cognate part of a Program of Study. At least one-half of the credits for all degrees must be in courses numbered 500 or higher. Graduate credit will not be given for courses that are not approved for graduate credit at the time that they are taken. Courses taken for undergraduate credit cannot be retaken for graduate credit.

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.

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 graduate 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.

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.

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.

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.

Leave of Absence from Graduate Study

Students who wish to take a leave of absence from their program must notify their graduate program and the School of Graduate Studies by requesting a leave of absence, by completing and submitting to the School of Graduate Studies the “Graduate Readmission or Leave of Absence” form available on the School of Graduate Studies Web page. The form must be submitted in advance of the leave. Degree and certificate seeking students who do not submit a leave of absence will be required to apply for readmission to the School of Graduate Studies and pay a readmission application fee. Applications for readmission will be reviewed by the program and Graduate Dean. Students may be denied readmission based on review of their prior progress and their application for readmission.

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 my 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 toward the 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, 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. 356)” 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. 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, Deferred Admission, or Post-Baccalaureate 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 Research Professorships, which allow faculty to work with their students on research during the summer session, and Summer Doctoral Fellowships, which
allow Ph.D. candidates to spend full time on their research, and to support doctoral student conference travel and dissertation research.

The annual School of Graduate Studies Scholarly Forum features the research and creative scholarship of students and faculty. The Scholarly Forum 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. 344) 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 can be 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 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. 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.

**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, material transfer, 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.

**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.

**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.

**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.

**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 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.

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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 of
the IBC approval. Collection of data may not begin until the topic proposal is approved.

Intellectual Property

The University of North Dakota has detailed policies regarding intellectual property, patents, and copyrights. Students wishing more information about intellectual property rights are referred to the Office of Intellectual Property Commercialization and Economic Development.

Residence Requirements

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 required 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. 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,” 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 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. Once a student has received signed preliminary approval and has made all of the corrections from her/his committee, and before the final copy is printed, 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.

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 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. 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.

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. However, 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. Any exceptions must be approved by the Dean of the School of Graduate Studies.

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.

A preliminary draft of the dissertation 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 dissertation must meet the requirements for publication as a University of North Dakota dissertation and is subject to the University of North Dakota copyright. The dissertation must be submitted to the School of Graduate Studies in partial fulfillment of the requirements of the degree. Credit will be given for the study or scholarly project 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 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 student must deposit the approval form in the School of Graduate Studies to become part of the record before a student is advanced to candidacy for a master’s degree.

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. Once a student has received signed preliminary approval and has made all of the corrections from her/his 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 will be printed and bound by ProQuest and cataloged in the University Library.

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. 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. 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

The following vaccines are available:

- Influenza (flu) shots
- Gardasil (HPV)
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 from the School of Graduate Studies or 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 (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/doctorofarts)
- Doctor of Philosophy (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/doctorofphilosophy)
- Doctor of Physical Therapy (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/doctorofphysicaltherapy)
- Joint JD-MBA (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/jointjdmba)
- Joint JD-MPA (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/jointjdpma)
- Joint MD-PhD (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/jointmdphdprogram)
- Master of Arts and Master of Science (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofartsandmasterofscience)
- Master of Business Administration (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofbusinessadministration)
- Master of Engineering (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofengineering)
- Master of Environmental Management (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofenvironmentalmanagement)
- Master of Music (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofmusic)
- Master of Physician Assistant Studies (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofphysicianassistantstudies)
- Master of Public Administration (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/masterofpublicadministration)
- Specialist Diploma (http://und-public.courseleaf.com/graduateacademicinformation/degreerequirements/specialistdiploma)

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.

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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. 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.

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, material transfer, 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.

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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 of the IBC approval. Collection of data may not begin until the topic proposal is approved.

Intellectual Property
The University of North Dakota has detailed policies regarding intellectual property, patents, and copyrights. Students wishing more information about intellectual property rights are referred to the Office of Intellectual Property Commercialization and Economic Development.

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.
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, appropriate action is taken;
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 recuse 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 and;
   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 excluding 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 should notify the Graduate Dean and the Chair of the Graduate Committee. The Panel during the hearing;

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. 361)
- Admissions Policies and Procedures (p. 345)
- Aerospace Sciences (p. 363)
- Anatomy and Cell Biology (p. 363)
- Art and Design Visual Arts (p. 363)
- Arts and Sciences (p. 365)
- Atmospheric Sciences (p. 366)
- Aviation (p. 368)
- Biochemistry and Molecular Biology (p. 375)
- Biology (p. 375)
- Biomedical Sciences (p. 380)
- Business Administration (p. 386)
- Chemistry (p. 391)
- Clinical Translational Science (p. 395)
- Communication Sciences and Disorders (p. 400)
- Communication (p. 398)
- Computer Science (p. 403)
- Counseling Psychology and Community Services (p. 407)
- Criminal Justice (p. 414)
- Degrees and Degree Requirements (p. 357)
- Earth System Science and Policy (p. 416)
- Economics (Applied) (p. 420)
- Education (p. 423)
  - Curriculum and Instruction (p. 447)
  - Early Childhood Education (p. 448)
  - Educational Foundations and Research (p. 435)
  - Educational Leadership (p. 438)
  - Elementary Education (p. 449)
  - English Language Learners (TESOL) (p. 451)
  - Higher Education (p. 452)
  - Instructional Design and Technology (p. 455)
  - Reading Education (p. 459)
  - Special Education (p. 461)
  - Teaching and Learning (p. 443)
- Engineering (p. 469)
  - Chemical Engineering (p. 472)
  - Civil Engineering (p. 475)
  - Electrical Engineering (p. 479)
  - Energy Systems Engineering (p. 483)
  - Environmental Engineering (p. 485)
  - Geological Engineering (p. 488)
  - Mechanical Engineering (p. 492)
  - Petroleum Engineering (p. 496)
- English Language and Literature (p. 498)
- Geography and Geographic Information Science (p. 502)
- Graduate Program Summaries (http://und-public.courseleaf.com/graduateacademicinformation/departmentalcoursesprograms/graduateprogramsummaries)
- Harold Hamm School of Geology and Geological Engineering (Geol and GeoE) (p. 505)
- History (p. 511)
- Kinesiology and Public Health Education (p. 515)
- Linguistics (p. 517)
- Mathematics (p. 520)
- Medical Laboratory Science (p. 523)
- Microbiology and Immunology (p. 525)
- Music (p. 528)
- Nursing (p. 533)
  - Adult-Gerontology Primary Care Nurse Practitioner (p. 542)
  - Advanced Public Health Nurse (p. 542)
  - Doctor of Nursing Practice (p. 544)
  - Doctor of Philosophy (p. 545)
  - Family Nurse Practitioner (p. 540)
  - Nurse Anesthesia (p. 538)
  - Nurse Educator (p. 539)
  - Post-Master's Certificates in Nursing (p. 543)
  - Psychiatric Mental Health Nursing Nurse Practitioner (p. 541)
- Nutrition and Dietetics (p. 546)
- Occupational Therapy (p. 548)
- Pharmacology, Physiology and Therapeutics (p. 552)
- Physical Education (p. 556)
- Physical Therapy (p. 556)
- Physician Assistant Studies (p. 559)
- Physics and Astrophysics (p. 563)
- Psychology (p. 566)
- Public Administration (p. 571)
- Public Health (p. 575)
- Social Work (p. 578)
- Sociology (p. 582)
- Space Studies (p. 583)
- Speech-Language Pathology (p. 589)
- Technology (p. 590)
- Theatre Arts (p. 591)
- University Courses (p. 592)

Accountancy

The Master of Accountancy Program has been suspended and no new applications are being accepted at this time.

http://business.und.edu/accountancy/

FACULTY: Beard, Byars, Campbell, Carlson, DeMagalhaes, Dosch, Ellingson, Hansen, Loyland and Wilde

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. While primarily intended for individuals entering public accounting, the MAcc may also serve those who wish to pursue careers in industrial and governmental/nonprofit accounting. Additionally, this Program would prepare those wishing to pursue further study in a doctoral program.
Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees section.

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 Provisional 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 the prerequisites 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 4.00 scale), for all foundation courses completed or attempted, and 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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<tr>
<td>Elements or Principles of Accounting</td>
<td>6</td>
</tr>
<tr>
<td>Principles of Management</td>
<td>3</td>
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<tr>
<td>Principles of Marketing</td>
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<tr>
<td>Business Law</td>
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<tr>
<td>Principles of Finance</td>
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<tr>
<th>Accounting</th>
<th>Credits</th>
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<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>
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<tr>
<td>Tax</td>
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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:

   - ACCT 501 Seminar in Financial Accounting 3
   - ACCT 504 Seminar in Auditing 3
   - ACCT 508 Fraud Examination 3
   - ACCT 509 Accounting Information for Decision and Control 3
   - FIN 501 Managerial Finance 3
   - ISBC 517 Advanced Accounting Systems 3
   - ACCT 997 Independent Study 2

   Total Credits 20

2. 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.

3. 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.

4. 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 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. Prerequisites: ACCT 200, ACCT 201, MATH 146, and ECON 210.

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. 369) or Space Studies (p. 583): Aerospace Sciences Ph.D. program)

Anatomy and Cell Biology

The Anatomy & Cell Biology program is no longer accepting applications.

Please go to the Biomedical Sciences page at:
http://und-public.coursera.com/graduateacademicinformation/
departmentalcoursesprograms/biomedicals/changes/
http://und-public.coursera.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 Catalog) 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: Fink, Ganje, Gonzalez-Smith, Hebert, Jones (Chair), Jonientz, Luber, Monsebroten (Graduate Program Director), Smith and Widmer

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, fibers, photo, time-based media 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 identified 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:
2. Major Emphasis Area (Ceramics, Painting, Drawing, Metalsmithing, Printmaking, Mixed Media, or Sculpture) 30
3. Art History and Theory (see #6 under Admission Requirements) 9
4. Electives (including at least 12 credits in art) 18
5. Professional Exhibition 3

**Total Credits:** 60

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 thesis 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.

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<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Project</th>
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<tbody>
<tr>
<td>First Year</td>
<td>Fall Semester</td>
<td>Full Faculty Critique</td>
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<td>Spring Semester</td>
<td>Full Critique</td>
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<td>Second Year</td>
<td>Fall Semester</td>
<td>Form Thesis Committee</td>
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<td>First Committee Review</td>
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<td>Turn in Program of Study to School of Graduate Studies for approval</td>
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<tr>
<td>Third Year</td>
<td>Fall Semester</td>
<td>Second Committee Review</td>
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<td></td>
<td>Spring Semester</td>
<td>ART 599: Professional Exhibition and Artist Lecture</td>
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#### 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.
Individual research and experimentation 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 apprentice 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.S.

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: 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 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.

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, Dong, Gilmore, Kennedy, Osborne (Graduate
Director), Mullendore, Poellot (Chair), Xi 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 an intellectual environment conducive to exemplary research,
scholarship, and creativity among graduate students and faculty.

Goal 1: Students will develop a comprehensive understanding of atmospheric
sciences in a changing world.

Goal 2: Students will develop critical thinking skills through research activities
or focused project activities.

Goal 3: Students will develop skills to analyze, interpret, and synthesize
scientific data and communicate the results in an effective and professional
manner.

Doctor of Philosophy (Ph.D.)

Mission Statement and Program Goals

The mission of the Department of Atmospheric Sciences doctoral program is to
provide an educational environment that deepens student knowledge of the
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 36 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.

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>ATSC 500</td>
<td>Introduction to Atmospheric Research</td>
<td>3</td>
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<tr>
<td>Select one of the following (Dynamics):</td>
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<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>3</td>
</tr>
<tr>
<td>ATSC 548</td>
<td>Advanced Mesoscale Dynamics</td>
<td>3</td>
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<td>Select one of the following (Physical):</td>
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<tr>
<td>ATSC 450</td>
<td>Introduction to Cloud Physics Meteorology</td>
<td>3</td>
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<tr>
<td>ATSC 520</td>
<td>Atmospheric Chemistry</td>
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<td>ATSC 525</td>
<td>Atmospheric Radiation</td>
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**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. At least one letter of recommendation that comments on their research ability, and 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.
6. Two consecutive years of full-time academic work completed in residence.
7. 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.
8. Up to 9 credits may be taken through distance education.
9. Completion of 90 semester credits beyond a bachelor’s degree or 60 semester credits beyond a master’s degree.

**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:

| ATSC 555 | Advanced Surface Transportation Weather |
| ATSC 560 | Boundary Layer Meteorology |
| ATSC 565 | Air Quality |

Select one of the following (Climate Systems):

- ATSC 510 General Circulation
- ATSC 515 Advanced Climatology
- ATSC 545 Hydrometeorology
- ATSC 550 Tropical Meteorology
- ATSC 530 Numerical Weather Prediction

Select one of the following (Tools):

- ATSC 441 Radar Meteorology **
- ATSC 528 Atmospheric Data Analysis
- ATSC 530 Numerical Weather Prediction
- ATSC 535 Measurement Systems
- ATSC 540 Statistical Methods in Atmospheric Science

Select one of the following (Thesis or Independent Study): 2

- ATSC 997 Independent Study Report (Non-Thesis Option)
- Thesis

Electives 9-17

Total Credits 24-32

** 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. F.

**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. Quasigeotropic and semi-geotropic 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.
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 coursework in statistics or consent of instructor.

ATSC 545. Hydrometeorology. 3 Credits.
A course designed to study the coupling of atmospheric and hydrologic processes. Topics will cover basic hydrologic 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 556. 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 558. Boundary Layer Meteorology. 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 559. Air Quality. 3 Credits.
An advanced course in 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.

ATSC 599. Continuing Enrollment. 1-12 Credits.
Repeatable. 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 505. 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 505. 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 characteristics 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
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) Anderson, Bjerke, Bridewell, Drechsel, Higgins, Jensen, Kenville (Graduate Program Director), Lindseth, Petros, Robertson, Smith, Ulrich, Venhuizen and Watson

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 answering specific questions per departmental guidelines. One of the questions will address the potential thesis or independent study topic. Students that 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:
   - AVIT 501 General Issues in Aviation/Aerospace 3
   - AVIT 502 Aviation Economics 3
   - AVIT 503 Statistics 3
   - AVIT 504 Research Methods 3
   - AVIT 595 Aviation Capstone 3
   - AVIT 997 Independent Study 2
   - or AVIT 998 Thesis

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:
   - Program of Study
   - Advisor Selection
   - Independent Study/Thesis Option
   - 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:

   - 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
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 AVIT 501 General Issues in Aviation/Aerospace, SPST 501 Survey of Space Studies I, AVIT 521 Ethics in Aerospace and AVIT 590 Aviation Seminar/SPST 590 Space Studies Colloquium
- 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.

1. AVIT 501 General Issues in Aviation/Aerospace
2. SPST 501 Survey of Space Studies I
3. AVIT 521 Ethics in Aerospace
4. AVIT 590 Aviation Seminar/SPST 590 Space Studies Colloquium: (2 semesters, 2-4 credits total)

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 PhD program.

- AVIT 503 Statistics (or equivalent)
- AVIT 504 Research Methods
- SPST 504 Research Methods in Space Studies
- AVIT 505 Qualitative Research Methods
- AVIT 506 Quantitative Research Methods
- AVIT 507 Advanced Research Methods

Course Designations (SPST)

Social area courses:

SPST 450 International Space Programs 3
SPST 540 Space Economics and Commerce 3
SPST 541 Management of Space Enterprises 3
SPST 545 Space and the Environment 3
SPST 551 History of the Space Age 3
SPST 552 History of Astronomy and Cosmology 3
SPST 555 Military Space Programs 3
SPST 560 Space Politics and Policy 3
SPST 561 Public Administration of Space Technology 3
SPST 565 Space Law 3
SPST 574 Remote Sensing in Developing Countries 3
SPST 575 Remote Sensing Law and Policy 3
SPST 581 Field Visit to Space Centers 1-3

Technical area courses:

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

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.

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:
      c. LAW 212 3
      LAW 214 3
      LAW 263 3
      LAW 282 2
      LAW 291 1-4
      LAW 299 2

Note: Law courses available on-campus only (not available via distance education).

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

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
AVIT 593 Individual Research in Aviation 1-3
Your natural text is as follows:

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 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 dissertation designs. Prerequisites: AVIT 503, AVIT 505, and AVIT 506.

AVIT 508. 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 509. 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 510. 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 511. 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 512. 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 513. Human Factors: Human Perceptions in Information Systems Design. 3 Credits.
An in-depth study 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 514. 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 515. 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 516. 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 517. 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 518. Applied 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 inter-disciplinary 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 inter-disciplinary 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 for 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 enviroments. 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 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 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 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.

SPST 596. Continuing Enrollment. 1-12 Credits.
Prerequisite: Department consent. Repeatable. S/U grading.

SPST 597. 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 598. 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 599. 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. Anthropicogenic 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.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.

Biology

http://arts-sciences.und.edu/biology/graduate/programs.cfm

FACULTY: Boulanger, Carmichael, Darby, D. Darland, T. Darland, Ellis, Felege, Goodwin (Chair), Kelisch, Manu, Meberg, Newman (Graduate Director), Ovtchinnikov, Pyle, Ralph, Rhem, Schlosser, Sheridan, Simmons, Tkach, Vaughan and Yorkonis

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 centrigues, Microm HM550 cryostat, Bio-Rad Experian microfluidics station, ABI and Bio-Rad real-time PCR systems, Bio-Rad Tetrad multi-block PCR thermocycler, automated DNA sequencer, UVP Autochem gel documentation system, Nanodrop spectrophotometer, Fluoview Confocal Microscope, and Microbrightfield Instruments design-based stereology system. 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, the Medical School, the USDA Human Nutrition Laboratory, and the UND Energy Technology Center.

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 9,500 years ago, leaving a series of beach ridges. These ridges have mostly disappeared, but two of the Ojata 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) 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 academia, 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.

**Goal 3:** Students will develop and display an understanding of professional ethics in the conduct of research, teaching, and service as scientists.

**Master of Science (M.S.)**

**Admission Requirements**

1. Must meet current minimum general requirements as published by the School of Graduate Studies.
2. Must provide GRE General test scores. Strength of scores will be considered regarding admission and awarding of departmental support.
3. Minimum GPA of at least 2.75 for all undergraduate work or 3.0 for the junior - senior credits.
4. Students must indicate thesis vs. non-thesis option upon application. M.S. (thesis) students may request a change to M.S. (non-thesis) only within the first two semesters (not including summer) of enrollment. Such requests will be evaluated by the Graduate Director and the student’s advisory committee.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Students admitted to the M.S. program may, after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the masters degree and work directly toward the Ph.D. degree. The same GRE and GPA requirements apply for by-pass as for students applying for the doctoral program through normal application procedures, i.e., a GPA no lower than 3.0 for work completed while in the M.S. program. The recommendation of the advisory committee shall be brought to a vote in a faculty meeting. A minimum of one week before such a meeting, the faculty shall be notified that the student’s updated file consisting of the materials used for application to the M.S. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered is available for review.

Students seeking summer or fall admission should complete their applications by February 15. Students seeking spring admission should check the School of Graduate Studies webpage for application deadline information. Master’s degree applicants should specify interest in either the thesis or non-thesis option. Inquiries should be directed to the Director of Graduate Studies, Biology Department.

**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 with 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 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.
5. Satisfactory completion of an acceptable thesis proposal (written proposal, proposal presentation and proposal 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, thesis seminar and thesis 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 includes 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 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 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 505L.

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 505A.

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.
Phytoecography, 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, Biorhythms, 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.

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 999. Dissertation. 1-15 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 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 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. Prerequisite or Corequisite: BIOL 364. F, odd years.

BIOL 369. Histology. 2 Credits.
Microscopic 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 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, 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 90 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 BIOL 151L or an equivalent approved by the department. 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 an 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, 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.

Biomedical Sciences

http://www.med.und.edu/basic-sciences/

FACULTY: Bradley, Brissette, Brown-Borg, Carlson, Carr, Carvelli, Chen, Combs (Department Chair), Condy, Dhasarathy, Doze, Dunlevy, Flower (Program Director), Foster, Geiger, Ghibi, Golovko, Grove, Haselton, Henry, Hill, Hur, Kotb, Lei, Meyer, Milavetz, Mishra, Murphy, Nechaev, Nilles, Ohm, Porter, Rosenberger, Rui, Shabb, Sharma, Singh, Sukalski, Tessema, Vaughan, Watt, and Wu

JOINT FACULTY: 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>
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<tr>
<td>ANAT 591</td>
<td>Special Topics in Anatomy and Cell Biology</td>
<td>1-3</td>
</tr>
<tr>
<td>BMB 533</td>
<td>Advanced Topics</td>
<td>1</td>
</tr>
<tr>
<td>MBIO 501</td>
<td>Molecular Virology</td>
<td>2</td>
</tr>
<tr>
<td>MBIO 504</td>
<td>Microbial Physiology</td>
<td>2</td>
</tr>
<tr>
<td>MBIO 508</td>
<td>Microbial Pathogenesis</td>
<td>2</td>
</tr>
<tr>
<td>MBIO 509</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MBIO 512</td>
<td>Microbial Genetics</td>
<td>2</td>
</tr>
<tr>
<td>MBIO 515</td>
<td>Advanced Topics</td>
<td>2</td>
</tr>
<tr>
<td>MBIO 519</td>
<td>Advanced Immunology</td>
<td>2</td>
</tr>
<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>PPT 511</td>
<td>Biochemical and Molecular Mechanisms of Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PPT 512</td>
<td>Special Topics in Pharmacology, Physiology and Therapeutics</td>
<td>2</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>
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<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 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>
<tr>
<td>BIMD 520</td>
<td>Principles of Neuroanatomy</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 521</td>
<td>Neurophysiology</td>
<td>2</td>
</tr>
<tr>
<td>BIMD 522</td>
<td>Principles of Neuropharmacology</td>
<td>2</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.

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.

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 course work.

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:

   - ANAT 513 Gross Anatomy 6
   - ANAT 517 Principles of Histology 3
   - ANAT 521 Principles of Developmental Biology 3
   - ANAT 522 Neuroscience 6
ANAT 591 Special Topics in Anatomy and Cell Biology 1-3
BMB 533 Advanced Topics 1-9
MBIO 501 Molecular Virology 2
MBIO 504 Microbial Physiology 2
MBIO 508 Microbial Pathogenesis 2
MBIO 509 Immunology 3
MBIO 512 Microbial Genetics 2
MBIO 515 Advanced Topics 2
MBIO 519 Advanced Immunology 2
PPT 500 Principles of Physiology and Pharmacology 6
PPT 503 Advanced Pharmacology or Physiology 3
PPT 505 Research Techniques 1
PPT 511 Biochemical and Molecular Mechanisms of Pharmacology 3
PPT 512 Special Topics in Pharmacology, Physiology and Therapeutics 1
PPT 525 Advanced Renal Physiology 3
PPT 526 Advanced Respiratory Physiology 3
PPT 527 Advanced Neurophysiology 3
PPT 528 Advanced Endocrinology 3
PPT 529 Adv Cardiovascular Physiology 3
PPT 530 Advanced Neurochemistry 3
PPT 535 Mechanisms of Neurodegenerative Disorders 3
PPT 540 Molecular Neuropharmacology 3
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
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

6. 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 in the program.

7. Students must maintain a minimum 3.0 GPA in accordance with School of Graduate Studies guidelines (UND Graduate and Undergraduate Academic Catalog).

8. Students must successfully complete the comprehensive examination.

9. Students must fulfill the teaching requirement as defined by the student’s Faculty Advisory Committee in consultation with the Department Chair and the Director of Graduate Studies in Biomedical Sciences.

10. Research and Dissertation: The Ph.D. degree requires completion of a dissertation based on the results of a 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 student will publish at least one first author peer-reviewed manuscript in a scientific or academic journal prior to the defense of their dissertation. The dissertation prepared by the candidate must be presented orally in a public forum and defended before the Faculty Advisory Committee and the Departmental Graduate Faculty and will be open to all members of the academic community.

**Combined M.D./Ph.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. 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 .
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 scientific information to an audience in a forum conducive to the development of their skills in effective communication. Seminars delivered by students, UND faculty, and other invited speakers present current advancements in biomedical 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 517. Principles of Histology. 3 Credits. Principles of Histology is a laboratory and discussion based course that 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 sufficient knowledge of histology to be capable of teaching this material to medical, professional, graduate, and undergraduate students. F.

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 997. Independent Study. 2 Credits.

ANAT 998. Thesis. 1-9 Credits. Repeatable to 9 credits.

ANAT 999. Dissertation. 1-15 Credits. Repeatable to 15 credits.

BIMD Courses

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 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 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 biochemical 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 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 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.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 998. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F.S.SS.

BIMD 999. 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, BIMD 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.

BMB 594. Special Problems in Biochemistry and Molecular Biology. 1-6 Credits.
The student in consultation with a faculty member of the department undertakes a laboratory research project. Prerequisite: Consent of instructor.

BMB 595. Readings in Biochemistry and Molecular Biology. 1-3 Credits.
Selected readings and library research in an area of mutual interest to the student and a faculty member of the department. Conferences and/or written reports are required. Prerequisites: BIMD 500 or consent of instructor.

BMB 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

BMB 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

BMB 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

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 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.

MBIO 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

MBIO 997. Independent Study. 2 Credits.

MBIO 998. Thesis. 1-8 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/


Degree Granted: Master of Business Administration (M.B.A.)
The Master of Business Administration (M.B.A.) 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 (AACSBI). 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 M.B.A. 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 M.B.A program is available as part of a combined program resulting in both an undergraduate degree in a business area plus an M.B.A. 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. 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.
3. 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).
4. Command of the M.B.A. Prerequisite Curriculum (see description below), demonstrated through satisfactory completion of coursework or testing out of all of the courses found in the M.B.A. Prerequisite Curriculum. An individual may be provisionally admitted if all but nine credits of the M.B.A. Prerequisite Curriculum have been completed as of the date of application. All remaining M.B.A. Prerequisite Curriculum courses must be completed within one year of program admission. During this time, a provisional student will be allowed to take no more than nine credits of graduate coursework. It is critical that all course prerequisites are followed as the initial courses are taken in the program.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

M.B.A. Prerequisite Curriculum
Applicants must demonstrate command of a core curriculum in business and administration through course work in economics, accounting, quantitative methods, and the functional areas of business, mathematics, and administrative process. This command normally will be demonstrated by completion of the following UND undergraduate courses or their equivalents, or by competency examinations.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tr>
<td>ACCT 200 &amp; ACCT 201</td>
<td>Elements of Accounting I and Elements of Accounting II</td>
<td>6</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
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<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>MATH 146</td>
<td>Applied Calculus I</td>
<td>3</td>
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The non-thesis MB.A. curriculum includes the following required courses:

- MGMT 300 Principles of Management
- MGMT 301 Operations Management
- MRKT 305 Marketing Foundations

Business Communications, Marketing, Management, and Political Science and aspects of the program. Business courses carrying graduate credit status from Administration. The M.B.A. Program Director is responsible for coordinating all 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, Finance, Information Systems and Business Communications, Marketing, Management, and Political Science and Public Administration are described elsewhere in the graduate catalog. The M.B.A. degree program course requirements are:

1. A minimum of 33 semester credits of academic work. The program includes a non-thesis and a thesis option. The non-thesis option consists of 24 M.B.A. curriculum credits and sufficient cognate electives to total 33 semester hours. The thesis option consists of 24 M.B.A. curriculum credits plus BADM 998 Thesis for 4 semester hours, an approved research methods course (3 semester hours) and a cognate elective (3 semester hours) to total 34 semester hours.
2. At least one-half of the credits must be at or above the 500-level electives. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required may be transferred from another institution.
3. Cognate elective courses: Non-thesis (9 credits); Thesis (3 credits).
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.

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, Finance, Information Systems and Business Communications, Marketing, Management, and Political Science and Public Administration are described elsewhere in the graduate catalog. The M.B.A. degree program course requirements are:

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3. Cognate elective courses: Non-thesis (9 credits); Thesis (3 credits).
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.
Concentration in International Business

The International Business Concentration requires an additional 3 semester hours, thus making the M.B.A. with the International Business Concentration a total of 36 semester hours.

The concentration in International Business includes the following components:

1. UND and the respective foreign college/university must have a formal course transfer agreement in place prior to the approval of the student’s international experience.
2. Students will be admitted to the M.B.A. program. Those students admitted under qualified status must make significant progress towards satisfying needed prerequisite courses. Approval of the M.B.A. Director is necessary for inclusion in the International Business concentration.
3. Students will complete the first and the last semesters of their program of study at UND.
4. Students will take a maximum of nine semester hours from a foreign college/university to be approved for inclusion in their program of study. Students may take additional courses, but they will not be included as part of the M.B.A. program. 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.
5. Students are expected to take a workshop or course of study in cultural language studies from the foreign college/university beyond the nine semester hours of course work mentioned in #4.

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 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. Prerequisites: ACCT 200, ACCT 201, MATH 146, and ECON 210.

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.
ECON 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 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. Prerequisites: ECON 210 and MATH 146 or MATH 165. F.

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. Prerequisites: ECON 410. 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 516. Advanced Managerial Economics. 3 Credits.
Prerequisites: ECON 201, ISBC 117, ISBC 317, 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 410. 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. Prerequisite: ECON 410, ECON 411, ECON 416 and ECON 504. 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. Prerequisite: ECON 410 and ECON 504. F.

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: ECON 504 and ECON 505.

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 advisor 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. 2 Credits.

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. Prerequisites: MATH 146, ACCT 200 and ACCT 201. ECON 210 and FIN 310.

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.

FIN 547. 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. Information Systems. 3 Credits.
An overview of the role of information systems in the life of an organization, and an overview of current and emerging technologies such as data communications, e-commerce, and data mining. Prerequisite: ISBC 317. 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. Examine theory and research relevant to understanding the communication process. Topics include strategies of organizing, globalization, technology, power, and diversity.

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 on the special topic selected. Course may be repeated up to a total of 6 credits with permission of the department. Prerequisite: Department permission. Repeatable to 6 credits.

**MGMT Courses**

**MGMT 501. Quantitative Analysis for Management Decisions. 3 Credits.** Course consists of an application of quantitative techniques for management decisions. Both mathematical techniques and computer analysis of decisions will be stressed. Topics will include deterministic and probabilistic modes in areas such as linear and quadratic programing, inventory systems, queuing models, game theory, and simulation. Prerequisite: MGMT 301.

**MGMT 515. Advanced Managerial Theory. 3 Credits.** Analysis of macro- and micro-behavioral approaches to the study of effective human resource management within the organization. Topics covered include the environment, the individual, small group, leadership, motivation, job design, evaluation, rewards and growth. Macro-behavioral aspects such as organizational design, climate, and organizational process are also covered as these relate to human behavior in organizations. Prerequisite: MGMT 300 or consent of instructor and graduate standing.

**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 on 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.**

**MGMT 597. Readings in Management. 1-3 Credits.** Repeatable to 3 credits.

**MGMT 996. Continuing Enrollment. 1-12 Credits.** Repeatable. S/U grading.

**MGMT 997. Independent Study. 2 Credits.**

**MGMT 998. Thesis. 1-15 Credits.**

**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, Junior or Senior standing, and declared COBPA majors only. Prerequisite or Corequisite: MGMT 310. 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, Junior or Senior standing, and declared CoBPA majors only. F.

**Chemistry**

http://www.und.edu/dept/chem/mainpage.html

FACULTY: H. Abrahamson, Chu, Delhommelle, Du, Hoffmann, Kozliak, Kubatova, Novikov, Pierce (Chair), Smoliakova, 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
The mission of the Department of Chemistry Ph.D. 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 and communication skills based on the theory, principles, and techniques of chemistry. Graduates will be prepared to become professional research chemists essential contributors technically competent to undertake any important task (under strategic guidance of a Ph.D. Chemist).

**Goal 1: Learning Chemistry:** Students will increase their knowledge of chemistry facts and relationships, both theoretical and practical, improve their logical and critical thinking skills, including the interpretation of experiments designed by Ph.D. chemists.

**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 the most appropriate way to get a job done by acting ethically and professionally.
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 the 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
   e. CHEM 999 Research 10-12 credits
   f. CHEM 998 Thesis 4-6 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.

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
   Inorganic
      CHEM 510 Intermediate Inorganic Chemistry 3
      CHEM 511 Advanced Inorganic Chemistry 3
      CHEM 512 Organometallic Chemistry 3
   Organic
      CHEM 520 Advanced Organic Chemistry I 3
      CHEM 521 Advanced Organic Chemistry II 3
      CHEM 522 Advanced Organic Chemistry III 3
   Physical
      CHEM 530 Chemical Thermodynamics 3
      CHEM 531 Chemical Dynamics 3
      CHEM 532 Quantum Mechanics in Chemistry 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

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. Carbamions 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 cyclodadditions. 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 484 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 Cooperative 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 special emphasis on the Molecular and Pathological Basis of Human Disease. 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, who can be reached by e-mail or telephone: Scott Garrett, PhD – scott.garrett@med.und.edu 701-777-2657.

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 2.80 and a cumulative GPA of 3.30 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. 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

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 tract.

For students in the Pathogenesis of Human Disease tract, a minimum of 4 hours of elective courses selected from the following:

<table>
<thead>
<tr>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mbio 509</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 517</td>
<td>Principles of Histology</td>
<td>3</td>
</tr>
<tr>
<td>PATH 590</td>
<td>Readings</td>
<td>1-3</td>
</tr>
</tbody>
</table>

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, who can be reached by e-mail or telephone: Scott Garrett, PhD – scott.garrett@med.und.edu 701-777-2657.

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 2.80 and a cumulative GPA of 3.30 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. 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):

Foundation Coursework to be completed by all CTS graduate students:

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<td>PATH 505</td>
<td>Seminar in Clinical and Translational Science</td>
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<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 593</td>
<td>Research</td>
<td>1-6</td>
</tr>
<tr>
<td>PATH 999</td>
<td>Dissertation</td>
<td>1-15</td>
</tr>
</tbody>
</table>

For students in the Pathogenesis of Human Disease Tract, the following are required core courses:

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<td>ANAT 517</td>
<td>Principles of Histology</td>
<td>3</td>
</tr>
<tr>
<td>PATH 575</td>
<td>Molecular and Pathological Basis of Human Disease</td>
<td>4</td>
</tr>
<tr>
<td>PATH 591</td>
<td>Special Topics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Students in the Pathogenesis of Human Disease Tract 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

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 form 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 CTS 590 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. Prerequisites: 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 to 12 credits. S/U grading. 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 the 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 student's 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.

Communication

http://arts-sciences.und.edu/communication

FACULTY: Antonova (Graduate Director), Fiorio, Kim, Kalbfleisch, Lee, Pasch, Rakow, and Shafer

Doctor of Philosophy (Ph.D.) in Communication

The Communication Program offers a graduate program leading to the Doctor of Philosophy degree. Students entering the program with a bachelor's degree will earn a non-thesis Master's degree as part of completing the Doctoral Program. The Communication Program does not admit students who wish to earn only a Master of Arts degree in Communication without continuation on to the Ph.D. degree.

The intent of the Ph.D. program is to graduate students with scholarly competencies enabling them to assume roles as intellectual leaders of the field of international and intercultural communication as well as public intellectuals stimulating discussion of significant communication issues.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

The Ph.D. program in international and intercultural communication is administered and assessed according to specific Goals for Student Learning. The faculty has identified the follow learning goals for the program:

1. Students will be able to identify, articulate, and critically evaluate the theoretical perspectives that guide international/intercultural communication research
2. Students will be able to identify, articulate, and critically evaluate the major areas of international/intercultural research
3. Students will be able to conduct scientifically sound research in the area of international/intercultural communication
4. Students will be able to publish scholarly research in international/intercultural communication in well-respected outlets
5. Students will be able appropriately apply ethical guidelines to international/intercultural communication research
6. Students will be able to write competitive grant proposals in the areas of international/intercultural communication

Master of Arts in Communication:

1. A letter of application, including a statement of purpose answering the question of why one would be interested in advanced study of communication. This letter should also include an indication of a faculty member with whom applicant might work.
2. Acceptable performance on Graduate Record Examination General Test.
3. Completion of the equivalent of 20 undergraduate credits in speech communication and/or mass communication, journalism or related field, including at least 12 upper division credits.
4. Provide a transcript with a minimum 3.0 undergraduate Grade Point Average.
5. Three letters of recommendation.
6. To be considered for a teaching assistantship, the student must submit a statement of teaching philosophy.
7. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
8. Optional materials, including writing or work samples.

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 501</td>
<td>Theoretical Perspectives in Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 505</td>
<td>Concepts in Quantitative Communication Research</td>
<td>3</td>
</tr>
<tr>
<td>COMM 506</td>
<td>Concepts in Qualitative Communication Research</td>
<td>3</td>
</tr>
</tbody>
</table>

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 ability to articulate and synthesize ideas.
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. Thirty credit hours from a Master's degree in communication or related discipline may be applied toward the 90 credit hours.
2. Core Requirements, including: (15 cr)
   - COMM 501 Theoretical Perspectives in Communication 3
   - COMM 505 Concepts in Quantitative Communication Research 3
   - COMM 506 Concepts in Qualitative Communication Research 3
   - COMM 535 Intercultural Communication 3
   - COMM 550 International and Global Communication 3
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)
   Interdisciplinary coursework (maximum 9 credits)
   Remaining courses from COMM electives above

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 Perpectives 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 quantitative, 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 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, 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/cdis/index.html

FACULTY: Madden, Rami (Graduate Director & Chair), Robinson, Schill, Seddoh and Swisher

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 and the Doctor of Philosophy in Communication Sciences and Disorders.

The master’s degree program has been 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.

The doctoral program provides a background of study in normal and disordered speech, language and hearing. This program prepares the student for employment in a variety of settings including university teaching and research, clinical services and research, and/or research and consultation in industry.

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 supporting work in Audiology.

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.
clinical instruction, supervised clinical practical, and research experience for students that will lead to state, regional and national accreditation and licensing; to provide clinical services to individuals, groups and agencies within the University and the Grand Forks area; to provide professional leadership in local, state, and national organizations; to contribute to the body of knowledge concerning communication sciences and communication disorders; and to serve the University through participation in its governance. This mission is directed at meeting the interests and needs of the University of North Dakota constituency.

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 Phonatory 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

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 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 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
CSD 536 Stuttering Intervention 2
CSD 538 Management of Phonatory 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
Independent Study
CSD 997 Independent Study 2
Total Credits 49-68

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:

   - Seminar in Speech-Language Pathology and Audiology
   - Special Problems in Communication Disorders
   - Special Problems in CSD
   - Advanced Univariate Statistics
   - Experimental Design
   - Multivariate Analysis
   - Research Design in Speech and Hearing Sciences
   - Research Problems in Speech-Language Pathology-Audiology
   - Dissertation
   - Investigations in Child Language

The Doctor of Philosophy degree in Communication Sciences & Disorders is a research degree and is conferred only in recognition of high achievement in independent scientific research and scholarship. This research is expected to make a significant contribution to the student’s chosen area of study.

Students will enter holding a Master’s degree in Speech Pathology, Audiology, or Speech and Hearing Science. Students without this degree or equivalent coursework will be required to complete a core curriculum of the following eight courses currently offered at the Master’s level:

- CSD 530 Audiology for SLPs 1
- CSD 532 Neurogenic Communication Disorders I 3

### 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 434, 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 or higher. 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 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):

**Group 1**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 522</td>
<td>Theoretical Foundations of Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 532</td>
<td>High Performance Computing and Paradigms</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 565</td>
<td>Advanced Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 575</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>

**Group 2**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 513</td>
<td>Advanced Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 543</td>
<td>Advanced Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 551</td>
<td>Distributed Operating Systems</td>
<td>3</td>
</tr>
<tr>
<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.

**Scientific Computing Doctor of Philosophy (Ph.D.)**

**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**

All students are required to obtain interdisciplinary graduate training. This requirement may be met by:

1. Taking two course clusters from the computational category and one course cluster from an applications category, or
2. Taking three course clusters from the computational category and conducting dissertation research in an applications category in the applicable department.

Course clusters must be approved by the student’s Faculty Advisory Committee.

- Students may, with approval of the Computer Science Department’s Graduate Committee, design their own applications category cluster.
- The student’s Faculty Advisory Committee must include one member from the applicable applications cluster or dissertation research.
- The Computer Science Department’s Graduate Committee must approve the Faculty Advisory Committee membership.
- 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
clustering. In addition, the student’s Faculty Advisory Committee will comprise only Computer Science faculty.

Students with approved Bachelor’s degree:

- Complete 51-66 credit hours of coursework.
- Complete eight of the core courses.

Students with approved Master degree:

- Complete 27-39 credit hours of coursework.
- Complete four of the core courses.

Elective courses: CSCI 500 Graduate Orientation and CSCI 566 Software Engineering Project may not be used as electives. Only 3 credits of CSCI 591 Directed Studies may be used as an elective.

Successful completion of a written qualifying examination taken within the first two years of admittance into the program.

CSCI 599 Research 1-21
CSCI 999 Dissertation 1-12

Final oral examination, which includes a defense of the dissertation.

Core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 513</td>
<td>Advanced Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 522</td>
<td>Theoretical Foundations of Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 532</td>
<td>High Performance Computing and Paradigms</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 543</td>
<td>Advanced Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 551</td>
<td>Distributed Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 555</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 565</td>
<td>Advanced Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 575</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 463</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 562</td>
<td>Formal Specification Methods</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 565</td>
<td>Advanced Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 582</td>
<td>Software Architecture</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 455</td>
<td>Database Management Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 513</td>
<td>Advanced Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 515</td>
<td>Data Engineering and Management</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 540</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 544</td>
<td>Soft Computing</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 554</td>
<td>Applications in AI/Computational Intelligence</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 427</td>
<td>Advanced Data Communications</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 551</td>
<td>Distributed Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 555</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

5. High Performance Computing Cluster: The cluster provides an understanding of the system architecture (hardware, network, and storage devices) and the software technologies (MPI, PVM, and Java) required to create a system capable of high performance computing. Requires the following three courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 451</td>
<td>Operating Systems I</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 532</td>
<td>High Performance Computing and Paradigms</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 575</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>

6. Graphics and Visualization Cluster: The goal of this track is for the student to master the OpenGL graphics library, to develop a working understanding of signal and image processing techniques, and to be able to apply those skills to the visualization of results generated by complex computer simulations. Requires the following three courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 446</td>
<td>Computer Graphics I</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 448</td>
<td>Computer Graphics II</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 547</td>
<td>Scientific Visualization</td>
<td>3</td>
</tr>
</tbody>
</table>

7. Modeling and Simulation Cluster: In this cluster the student will study the various techniques for developing mathematical models and software simulations to predict the behavior of complex physical phenomena. Requires the following three courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 460</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 445</td>
<td>Mathematical Modeling and Simulation</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 545</td>
<td>Discrete Dynamical Systems Modeling and Simulation</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 461</td>
<td>Numerical Analysis</td>
<td>3</td>
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</tbody>
</table>

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 mathematics courses. Possible courses include:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 470</td>
<td>Thermodynamics &amp; Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 471</td>
<td>Quantum Mechanics &amp; Spectroscopy</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 530</td>
<td>Chemical Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 534</td>
<td>Quantum and Computational Chemistry</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 402</td>
<td>Computers in Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 509</td>
<td>Methods of Theoretical Physics</td>
<td>3</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>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>PHYS 510</td>
<td>Methods of Theoretical Physics</td>
<td>3</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 505</td>
<td>Advanced Atmospheric Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 530</td>
<td>Numerical Weather Prediction</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATSC 528</td>
<td>Atmospheric Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ATSC 535</td>
<td>Measurement Systems</td>
<td></td>
</tr>
<tr>
<td>ATSC 540</td>
<td>Statistical Methods in Atmospheric Science</td>
<td></td>
</tr>
<tr>
<td>ATSC 555</td>
<td>Advanced Surface Transportation Weather</td>
<td></td>
</tr>
<tr>
<td>ATSC 575</td>
<td>Current/Special Topics in Meteorology</td>
<td></td>
</tr>
</tbody>
</table>

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 544. 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 545. 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 transformations, 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 the 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 systems, 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.S.

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 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

CSCI 997. Independent Study. 2 Credits.
Repeatable to 9 credits.

CSCI 999. Thesis. 1-9 Credits.
Repeatable to 12 credits. F.S.S.S.

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. S, odd years.

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 490. Seminar 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://www.und.nodak.edu/dept/registrar/catalogs/graddept/depts/coun.htm#PhD

FACULTY: Edwards, Juntunen (Ph.D. Training Co-Director), Navarro (Ph.D. Training Co-Director), Perry (Master's Director), Tillman, Walker, Wettersten (Chair) and Whitcomb

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). Graduates of the M.A. program are eligible to apply for licensure as a school Counselor in North Dakota as well as other states. Completion of the M.A. program partially fulfills requirements for certification as a School Counselor or certification as a Certified Rehabilitation Counselor or license as an Addiction Counselor in North Dakota. 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 is 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 baccalaureate and master’s level. The Department is committed to diversity, particularly to training for Native Americans, and emphasizes the role of social justice across all psychological practice. The program offers unique training in Rural Psychology in Integrated Care Settings, with support of a federal Graduate Psychology education grant.

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, 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.
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 credit hours 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:

- COUN 502 Professional Issues in Counseling
- COUN 503 Professional Issues: Internship and Job Preparation
- COUN 507 Life-Span Development in Counseling
- COUN 510 Counseling Methods
- COUN 515 Methods of Research
- COUN 516 Counseling Research Laboratory
- COUN 518 Group Theory and Process
- COUN 519 Career Counseling
- COUN 520 Diagnostic and Prevention Strategies in Counseling
- COUN 529 Dynamics of Addiction
- COUN 530 Theories of Counseling, Personality and Development
- COUN 531 Psychology of Women, Gender and Development
- COUN 532 Multicultural Counseling
- COUN 533 Couples And Family Counseling
- COUN 580 Counseling Practicum

Total Credits

Plus One of the Following Emphasis Areas:

**Addiction Counseling Emphasis**

- COUN 501 Ethics: Counseling and Counseling Psychology
- COUN 517 Psychological Testing
- COUN 587 Addictions Counseling Internship (2 semesters; 4-6 credits/semester)
- COUN 995 Scholarly Project or COUN 997 Independent Study or COUN 998 Thesis

Electives (i.e.)

- COUN 505 History of Psychology
- COUN 560 Supervision Theory and Technique
- COUN 561 Consultation Theory and Practice
- COUN 562 Consultation Laboratory
- COUN 565 Professional Seminars
- COUN 585 Counseling Psychology Research Practicum

**Community Mental Health Counseling Emphasis**

- COUN 501 Ethics: Counseling and Counseling Psychology
- COUN 517 Psychological Testing
- COUN 584 Community Counseling Internship (2 semesters; 4 credits/semester)
- COUN 995 Scholarly Project or COUN 997 Independent Study or COUN 998 Thesis

Electives (i.e.)

- COUN 505 History of Psychology
- COUN 560 Supervision Theory and Technique
- COUN 561 Consultation Theory and Practice
- COUN 562 Consultation Laboratory
- COUN 565 Professional Seminars
- COUN 585 Counseling Psychology Research Practicum

**Rehabilitation Counseling Emphasis**

- COUN 506 Rehabilitation Counseling: Foundations and Ethical Issues
- COUN 514 Rehabilitation Counseling: Assessment and Evaluation
- COUN 588 Rehabilitation Counseling Internship (2 semesters; 4 credits/semester)
- COUN 995 Scholarly Project or COUN 997 Independent Study or COUN 998 Thesis

Electives (i.e.)

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<thead>
<tr>
<th>Course</th>
<th>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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<td>Professional Issues: Internship and Job Preparation</td>
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<td>Life-Span Development in Counseling</td>
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<td>Counseling Methods</td>
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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 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>
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<td>COUN 529</td>
<td>Dynamics of Addiction</td>
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<tr>
<td>COUN 585</td>
<td>Counseling Psychology Research Practicum</td>
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Total Credits

- COUN 505 History of Psychology
- COUN 560 Supervision Theory and Technique
- COUN 561 Consultation Theory and Practice
- COUN 562 Consultation Laboratory
- COUN 565 Professional Seminars
- COUN 585 Counseling Psychology Research Practicum

Electives (i.e.)

A Master of Arts in Counseling, with a school counseling emphasis is offered via a 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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<tr>
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<tr>
<td>COUN 501</td>
<td>Ethics: Counseling and Counseling Psychology</td>
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<td>COUN 510</td>
<td>Counseling Methods</td>
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<td>Methods of Research</td>
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<td>COUN 522</td>
<td>Management of School Counseling Programs</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 531</td>
<td>School Counseling Practicum</td>
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<td>COUN 589</td>
<td>School Counseling Internship (2-3 CR, 6-8 total)</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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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. Overall GPA of 2.0
3. Minimum GPA of 3.0 in all undergraduate work.
4. 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 522 Management of School Counseling Programs 2
   - COUN 523 Elementary School Counseling 2
   - COUN 524 Middle School Counseling 2
   - COUN 525 Secondary School Counseling 2
   - COUN 526 Educational Collaboration 3
   - COUN 527 School-Based Family Counseling 3
   - COUN 530 Theories of Counseling, Personality and Development 3
   - COUN 531 School Counseling Practicum 3
   - COUN 589 School Counseling Internship (2-3 CR, 6-8 total) 6-8
   - COUN 995 Scholarly Project 2
   - or COUN 997 Independent Study 2

Total Credits

With educator license 48
Without educator license 50

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
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 cannot 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 the psychological foundations of behavior (select 1 course from each foundation, 4 total):

- 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

Coursework in Research Methodologies (select one of the following options):

Option A
- PSYC 541 Advanced Univariate Statistics 3
- PSYC 542 Multivariate Statistics for 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 3
- 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 practice 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
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 during the growth 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 neurological behavioral, 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 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. S.

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 and approaches 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. F.

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 emphasis of the course is on test development, strategies based in classical testing theory, and 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. S.

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 566. 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 skills. 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 skills. 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. Repeatable to 8 credits. Repeatable to 8 credits. S/U grading. 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. Repeatable to 12 credits. Prerequisite: COUN 580. Repeatable to 12 credits. S/U grading. 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. Repeatable to 8 credits. Prerequisite: COUN 580. Repeatable to 8 credits. S/U grading.

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 595. 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 597. Independent Study. 2 Credits.

COUN 598. Thesis. 1-9 Credits. Repeatable to 9 credits.

COUN 599. 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 by the student’s advisory committee and offered 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**

CJ 510  Historical Perspectives in Criminology (UND)  3
CJ 511  Contemporary Perspectives in Criminology (UND)  3
CJ 515  Human Nature and Crime (UND)  3

**Methods**

CJ 520  Topics in Research Methods (UND)  3
CJ 522  Qualitative Research Methods in Criminal Justice (UND)  3
CJ 525  Advanced Quantitative Methods/Analysis (UND)  3
CJ 526  Special Topics in Quantitative Analysis (UND)  3
CJ 690  (MSU)  3

**Electives (18 Credits, 9 of which must be from the following list)**

CJ 535  Seminar in Juvenile Justice (UND)  3
or CJ 635  (MiSU)  3
CJ 540  Seminar in Criminal Justice Policy (UND)  3
or CJ 640  (MiSU)  3
CJ 545  Seminar in Rural Justice Issues (UND)  3
or CJ 645  (MiSU)  3
CJ 555  Seminar in Tribal Justice Systems (UND)  3
or CJ 650  (MiSU)  3
CJ 520  Topics in Research Methods (MiSU)  3
CJ 540  Seminar in Criminal Justice Policy (MiSU)  3
CJ 530  (MSU)  3
CJ 550  (MSU)  3
CJ 580  (MSU)  3
CJ 516  Theories of Punishment (UND)  3
CJ 565  Victimology (UND)  3
CJ 592  (MSU)  3
CJ 999  Dissertation (UND)  18

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 on 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: Hill, Kirilenko, Laguette (Chair), Romsdahl, Van Looy, Zhang and Zheng (Graduate Director)

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 environmental 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.

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 Master of Science in ESSP is to provide an integrated and creative learning environment that fosters intellectual growth, critical thinking, and practical engagement, especially in research and management of the Earth system and resources. The MS program is a thematic one, emphasizing practical experience, student-centered learning, and integration of knowledge across traditional disciplinary boundaries, and active dialogue both in and outside the classroom. The Master of Science is designed to accommodate a large range of research interests all of which must be multi-disciplinary. It is intended for those primarily interested in the science of the Earth's systems as well as how that science can be integrated into programs of action that lead to sustainability. Those who are highly focused in a particular discipline are encouraged to seek graduate opportunities in that discipline. Requirements for the MS degree will culminate in submission and defense of a thesis.

Goals and Associated Learning Outcomes

To achieve the MS mission, we target specific goals in the area of sustainability science and Earth System Science and Policy. The strategies are linked by a set of organizing principles that are essential to all program activities. These include:

1. Excellence in learning. In order to represent the full complexity of nature and sustainability science, crucial elements of the MS’s learning objectives include: a student-structured curriculum, a multi disciplinary teaching approach, and experiential learning environments.

2. Excellence in discovery. Research within the MS program is driven by societal needs and values and occurs within an Earth System Science paradigm, in which the Earth is treated as a single system that cannot be understood by summing the features of its component parts.

3. Excellence in engagement. Through its outreach and service activities, one of the chief aims of the program is to put knowledge to work creating new opportunities that advance society, solve scientific and social problems related to Earth System Science and Policy, and empower citizens to make informed decisions about their environment.

Given the broad mission statement and organizing principles of the Earth System Science and Policy program MS goals and learning outcomes for program graduates include:

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.

2. A strong foundation in applications-driven science, basic science, geographical information systems (GIS), remote sensing, environmental policy, and statistics.

3. Valuable hands-on experiences and the ability to understand the fundamental value of experimental work needed to substantiate theoretical developments.

4. Written and oral communication skills that will facilitate the presentation of ideas to peers and the public.

5. The ability to function within multi-disciplinary teams to accomplish goals of interest to the group.

6. Skills and experience using cutting-edge computer technology to solve complex applications problems.

7. An awareness of issues of scale associated with environmental sustainability and Earth System Science and Policy, i.e., spatial, temporal, impact, etc., and a broad sense of ethical and professional responsibilities.


Master of Environmental Management (M.E.M.)

Mission Statement and Program Goals

The mission of the Masters of Environmental Management is to provide an integrated and creative learning environment that fosters intellectual growth, critical thinking, and practical engagement especially in management of the Earth system and resources, acquired through practical experience in an internship. The MEM program is a thematic one, emphasizing practical experience especially through an Internship, student-centered learning, and integration of knowledge across traditional disciplinary boundaries, and active dialogue both in and outside the classroom. The Master of Environmental Management is a professional degree for those who seek careers as environmental managers or policymakers.

Goals and Associated Learning Outcomes

To achieve the MEM degree mission, we target specific goals in the area of sustainability science and Earth System Science and Policy. The strategies are linked by a set of organizing principles that are essential to all program activities. These include:

1. Excellence in learning. In order to represent the full complexity of nature and sustainability science, crucial elements of the MEM’s learning objectives include: a student-structured curriculum, a multi-disciplinary teaching approach, and experiential learning environments, especially emphasized through the Internship.
2. **Excellence in discovery.** Projects and research activities within the MEM are driven by societal needs and values and occur within an Earth System Science paradigm, in which the Earth is treated as a single system that cannot be understood by summing the features of its component parts.

3. **Excellence in engagement.** Through its outreach and service activities, one of the chief aims of MEM is to put knowledge to work creating new opportunities that advance society, solve scientific and social problems related to Earth System Science, and Policy, and empower citizens to make informed decisions about their environment.

Given the broad mission statement and organizing principles of the Earth System Science and Policy program, MEM goals and learning outcomes for program graduates include:

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.
2. A strong foundation in applications-driven science, basic science, geographical information systems (GIS), remote sensing, environmental policy, and statistics.
3. Valuable hands-on experiences and the ability to understand the fundamental value of experimental work needed to substantiate theoretical developments, and ensure the optimal development of environmental management practices.
4. Written and oral communication skills that will facilitate the presentation of ideas to peers and the public.
5. The ability to function within multi-disciplinary teams to accomplish goals of interest to the group and enable successful development of management practices.
6. Skills and experience using cutting-edge computer technology to solve complex research and applications problems.
7. An awareness of issues of scale associated with environmental sustainability and Earth System Science and Policy, i.e., spatial, temporal, impact, etc., and a broad sense of ethical and professional responsibilities.

**Doctor of Philosophy (Ph.D.)**

**Mission Statement and Program Goals**

The mission of the Doctor of Philosophy in ESSP is to provide an integrated and creative learning environment that fosters intellectual growth, critical thinking, and practical engagement, especially in research and management of the Earth system and resources. The PhD program is a thematic one, emphasizing practical experience, student-centered learning, and integration of knowledge across traditional disciplinary boundaries, and active dialogue both in and outside the classroom. The PhD in Earth System Science and Policy is intended to prepare innovative researchers and problem-solvers for the public and private sectors, as much as for academia. Its core requirement is an original contribution, presented in final form as a dissertation that assesses, mitigates, manages, remediates, or prevents a significant environmental problem. The program is multi-disciplinary and practical in nature, involving faculty from various disciplines and institutions, from public or private research laboratories, and stakeholders.

**Goals and Associated Learning Outcomes**

To achieve the PhD mission, we target specific goals in the area of sustainability science and Earth System Science and Policy. The strategies are linked by a set of organizing principles that are essential to all program activities. These include:

1. **Excellence in learning.** In order to represent the full complexity of nature and sustainability science, crucial elements of the PhD’s learning objectives include: a student-structured curriculum, a multi-disciplinary teaching approach, and experiential learning environments.
2. **Excellence in discovery.** Research within the PhD program is driven by societal needs and values and occurs within an Earth System Science paradigm, in which the Earth is treated as a single system that cannot be understood by summing the features of its component parts.
3. **Excellence in engagement.** Through its outreach and service activities, one of the chief aims of the program is to put knowledge to work creating new opportunities that advance society, solve scientific and social problems related to Earth System Science and Policy, and empower citizens to make informed decisions about their environment.

Given the broad mission statement and organizing principles of the Earth System Science and Policy program, PhD goals and learning outcomes for program graduates include:

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.
2. A strong foundation in applications-driven science, basic science, geographical information systems (GIS), remote sensing, environmental policy, and statistics.
3. Valuable hands-on experiences and the ability to understand the fundamental value of experimental work needed to substantiate theoretical developments.
4. Written and oral communication skills that will facilitate the presentation of ideas to peers and the public.
5. The ability to function within multi-disciplinary teams to accomplish goals of interest to the group.
6. Skills and experience using cutting-edge computer technology to solve complex applications problems.
7. An awareness of issues of scale associated with environmental sustainability and Earth System Science and Policy, i.e., spatial, temporal, impact, etc., and a broad sense of ethical and professional responsibilities.

**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.

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ESSP 501 &amp; 501L</td>
<td>Earth System Science and Policy</td>
<td>10</td>
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<tr>
<td>ESSP 502 &amp; 502R</td>
<td>and Earth System Science and Policy Recitation</td>
<td>10</td>
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<tr>
<td>ESSP 503 &amp; 503L</td>
<td>and Earth System Science and Policy Laboratory</td>
<td>(offered in the Fall)</td>
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<tr>
<td>ESSP 504 &amp; 504R</td>
<td>and Earth System Science and Policy Recitation II</td>
<td>(offered in the Spring)</td>
</tr>
<tr>
<td>ESSP 505 &amp; 505R</td>
<td>and Earth System Science and Policy Laboratory II</td>
<td>(offered in the Spring)</td>
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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.

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.

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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<td>ESSP 501R</td>
<td>10</td>
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<td>ESSP 501L</td>
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<td>ESSP 502</td>
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<tr>
<td>ESSP 502R</td>
<td>10</td>
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<tr>
<td>ESSP 502L</td>
<td>10</td>
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</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ESSP 501</td>
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<tr>
<td>ESSP 501R</td>
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<td>ESSP 502</td>
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<td>ESSP 502R</td>
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<td>ESSP 502L</td>
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<tr>
<td>Electives</td>
<td>6-40</td>
</tr>
<tr>
<td>ESSP 596</td>
<td>24-48</td>
</tr>
</tbody>
</table>

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. 3 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 team project 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 502L. Earth System Science and Policy Laboratory II. 2 Credits.

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 Modelling. 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 aircraft, data acquisition and image processing tools, verification and validation techniques, precision navigation by Global Positioning Satellites, and advanced uses of Geographic Information Systems. Prerequisite: Consent of instructor.

ESSP 562. 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, studies how science does or does not inform environmental policymaking. 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 570. Communicating Environmental Information, 3 Credits.
The focus of this course is on communicating scientific information to non-science audiences. Students will 1) probe the role of communication in the public perceptions of environmental issues, 2) examine the effectiveness of different tools in raising environmental awareness, 3) explore the barriers that hinder effective communication and subsequent motivation to action, and 4) profile a variety of environmental outreach activities. Ways to convert polarization among differing parties into consensus by communicating accurate, timely information will be explored. Prerequisite: Consent of instructor.

ESSP 590. Colloquium Series, 1 Credit.
Speakers 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.

ESSP 594. Directed Study, 1-5 Credits.
Directed reading or investigations tailored to the needs of individual students for advanced knowledge in specific areas. Typically requires weekly meetings with the assigned faculty member. Usually culminates in a paper on the specific topical area. Doctoral candidates may repeat once. Prerequisite: Permission of an ESSP faculty member who agrees to serve as supervisor. Repeatable to 10 credits.

ESSP 596. Thesis, 3-9 Credits.
Academic credit for thesis research that has been approved in advance by a student's advisory committee. May be repeated, but no more than 9 credits will be allowed in a master's degree program. Prerequisite: Graduate standing in ESSP or consent of instructor. Repeatable to 9 credits.

ESSP 599. Dissertation, 3-18 Credits.
Academic credit for doctoral dissertation research that has been approved in advance by a student's advisory committee. May be repeated but no more than 18 credits will be allowed in the degree program. Prerequisite: Consent of instructor. Repeatable to 18 credits.

Economics (Applied)

http://business.und.edu/dept/economics/

FACULTY: Professors Bagheri, Biederman, Flynn (Department Chair), Goerner (Graduate Director), Lee, Simlai, O’Neill, Tan, Wang, and Yang.

Degree Granted: Master of Science in Applied Economics (M.S.A.E.)
The goal of the MS in Applied Economics program at the University of North Dakota is to provide students the quantitative and applied skills required to succeed as an economist involved in economic development, strategic planning, consulting, and applied research in a broad array of institutional settings. These goals are achieved through a program where coursework, experiential learning, and independent research develop a strong foundation to understand and apply economic theory, collect and analyze data, and communicate technical material effectively to others.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Science in Applied Economics (M.S.A.E.)

Admission Requirements
1. A four-year bachelor’s degree from a recognized college or university.
2. Applicants may be eligible for admission in “Qualified” status with nine 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.
3. 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).
4. 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.
5. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
6. 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 in Economics and Management and in Management, 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 90 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 degree through the Department of Applied Economics 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.

The MSAE curriculum varies according to whether the student chooses a thesis option or a non-thesis option (see below). The thesis option is available for students who conduct original research. 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.

The independent study must demonstrate the student’s ability to do independent scholarly work but does not demand an original contribution to knowledge. Independent study topics must be approved by and completed to the satisfaction of the student’s faculty advisor.

**Thesis Option (minimum of 31 credit hours)**

Required core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>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 534</td>
<td>Applied 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 506</td>
<td>Econometrics (Econometrics)</td>
<td>3</td>
</tr>
<tr>
<td>ECON 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives * 6

Total Credits 31

*Electives (minimum of 6 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.

**Non-thesis option (minimum of 32 credit hours)**

Required core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 411</td>
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<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>Applied 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 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
</tbody>
</table>

Electives * 9

Total Credits 32

*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.

**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. Prerequisites: ECON 210 and MATH 146 or MATH 165. F.
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. Prerequisites: ECON 410, 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 516. Advanced Managerial Economics. 3 Credits.
Prerequisites: ECON 201, ISBC 117, ISBC 317, 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 410. 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. Prerequisite: ECON 410, ECON 411, ECON 416 and ECON 504. 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. Prerequisite: ECON 410 and ECON 504. F.

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: ECON 504 and ECON 505.

ECON 592. Research in Economics. 2-3 Credits.
Research work and use of original documents; collecting and preparing of special topics and bibliographies; familiarizing the student with government publications and other materials 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. 2 Credits.
The independent study requires the student to investigate a topic in applied economics and to prepare a formal report satisfactory to the MSSE program director.

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 civil and international labor market. 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 utility 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 the 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

<table>
<thead>
<tr>
<th>Department</th>
<th>Chairperson</th>
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</thead>
<tbody>
<tr>
<td>Educational Foundations and</td>
<td>M. Weaver-Hightower</td>
</tr>
<tr>
<td>Research</td>
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</tr>
<tr>
<td>Educational Leadership</td>
<td>B. Kallio</td>
</tr>
<tr>
<td>Teaching and Learning</td>
<td>M. Baker</td>
</tr>
</tbody>
</table>

Graduate Directors

<table>
<thead>
<tr>
<th>Program</th>
<th>Director</th>
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<tbody>
<tr>
<td>Early Childhood Education</td>
<td>K. Vetava</td>
</tr>
<tr>
<td>Curriculum and Instruction</td>
<td>J. Holen</td>
</tr>
<tr>
<td>Educational Foundations and</td>
<td>C. Hunter</td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>Educational Leadership PK-12</td>
<td>B. Kallio</td>
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<tr>
<td>Emphasis</td>
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<tr>
<td>Elementary Education</td>
<td>B. Gourneau</td>
</tr>
<tr>
<td>English Language Learner Education</td>
<td>J. Shafer</td>
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<tr>
<td>Higher Education (EDL)</td>
<td>M. Healy</td>
</tr>
<tr>
<td>Instructional Design and Technology</td>
<td>W. Hung</td>
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<tr>
<td>Reading Education</td>
<td>S. Barrentine</td>
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<tr>
<td>Special Education</td>
<td>L. Chalmers</td>
</tr>
<tr>
<td>Teaching and Learning Doctorial</td>
<td>M. Zidon</td>
</tr>
<tr>
<td>Program</td>
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</tbody>
</table>

Graduate programs in education at UND are accredited by the National Council for the Accreditation of Teacher Education (NCATE) through 2015, 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 and the North Dakota Department of Public Instruction as appropriate.

Design of Graduate Programs: Critical Inquiry

The College of Education and Human Development admits students to advanced programs who are self-directed learners with considerable experience in the practice of education. 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.

Programs Offered

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
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</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>
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<td>M.Ed., M.S.</td>
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<tr>
<td>Reading Education</td>
<td>M.Ed., M.S.</td>
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<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:
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

### Comprehensive Examinations

Master’s and Specialist Diploma students in the Department of Educational Leadership take comprehensive examinations in the semester during which graduation is expected. Candidates take comprehensive examinations after making formal application to receive the Master’s or Specialist’s degrees and having been notified of eligibility in writing by the School of Graduate Studies. Students enrolled in the following master’s programs complete a Final Project in lieu of comprehensive exams: Curriculum & Instruction, Early Childhood Education, Elementary Education, English Language Learner Education, Instructional Design and Technology, Reading Education, and Special Education.

### Degrees Offered

The Master of Education (M.Ed.) and the Specialist Diploma (Ed.S) focus on professional practice from a broad educational perspective and admit only licensed educators. Both programs require completion of a final research paper or special project to culminate degree study. Refer to the Degree Requirements section in the programs offering these degrees.

The Master of Science (M.S.) degrees offered in education admit students who are licensed educators and others interested in the study of education. Degree requirements vary according to the background of the student and are described in the section devoted to each program. M.S. degree programs are available with thesis and non-thesis options. Note that the M.S. in Curriculum & Instruction is available to licensed teachers only.

The Doctor of Education (Ed.D.) and Doctor of Philosophy (Ph.D.) degrees are designed to prepare persons for leadership in the public schools or other educational agencies and for teaching and administration in colleges or universities. Study at the doctoral level requires that the student demonstrate analytic inquiry and creative scholarship in the study of education. The Ed.D. program focuses on study of professional practice and requires completion of independent work leading to an original dissertation with implications for the practice of education. The Ph.D. program emphasizes educational research and requires completion of independent work leading to an original dissertation focused on educational theory. Refer to the Degree Requirements section of the programs offering these degrees for delineation of requirements for the Doctor of Education and Doctor of Philosophy degrees.

For a complete picture of each degree program, the student is advised to read sections discussing the requirements of the School of Graduate Studies, the requirements of the Education faculty, the pages devoted to discussion of each of the programs offered, and the graduate handbooks available from the dean of the College of Education and Human Development and/or the department.

### 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

- 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

### Thesis and Independent Study Reports

All master’s degrees and the Ed.S. culminate in a final paper or project. The thesis in the Master of Science degree earns four to six credits. Both the Master of Education and the Master of Science (non-thesis) degrees require a two-credit Independent Study or Final Project instead of a thesis. The Independent study requirement may be met by completing a formal master’s paper. The Final Project requirement is met by completing a project that demonstrates critical analysis of a topic in a scholarly way and integrates information and experiences gained throughout the program of study. All theses, independent studies, or final projects must be based on an approved proposal. Note that the Department of Educational Leadership may have requirements that differ from those noted above.

<table>
<thead>
<tr>
<th>Course/Option</th>
<th>Credits</th>
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<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><strong>Total Credits</strong></td>
<td><strong>12</strong></td>
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**Option 2: Quantitative emphasis option:**

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<tbody>
<tr>
<td>EFR 510 Qualitative Research Methods (or equivalents)</td>
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<tr>
<td>EFR 516 Statistics II (or equivalents)</td>
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<tr>
<td>Select one of the following:</td>
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<tr>
<td>EFR 517 Advanced Research Methodologies (or equivalents)</td>
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<tr>
<td>EFR 518 Multivariate Analysis (or equivalents)</td>
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<tr>
<td>EFR 519 Research Seminar (or equivalents)</td>
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<tr>
<td>Approved Electives</td>
<td>3</td>
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<td><strong>12</strong></td>
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**Option 3: Tests and measurements option:**

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<tbody>
<tr>
<td>EFR 511 Program Evaluation (or equivalents)</td>
<td>3</td>
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<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>
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<td><strong>12</strong></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 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:**

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<td>3</td>
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<tr>
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</table>

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</thead>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>EFR 519 Research Seminar (or equivalents)</td>
<td></td>
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<tr>
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<td><strong>6</strong></td>
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</tbody>
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</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 to the student’s research.
• 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
T&L 539 College Teaching 3
T&L 544 ASD Assessment in Higher Education 3
T&L 545 Adult Learners 3
or T&L 544 Assessment in Higher Education

Select one of the following:
T&L 546 College Students with Special Needs 3
T&L 584 Internship in Education 1-8

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, Malott Stop 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
SPED 560 Introduction to Autistic Spectrum Disorder 3
SPED 561 Methods for Autistic Spectrum Disorder 3
SPED 567 ASD Assessment 3

Elective Courses
Select one of the following: 3
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 583 Internship: Autism Spectrum Disorders

Other courses as approved by the faculty advisor

Total Credits 12

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
IDT 580 Introduction to Web-Based Instruction

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

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

For Further Information:
Please contact Dr. Myrna R. Olson, College Certificate Program Coordinator, Department of Teaching and Learning, College of Education and Human Development, Malott Stop 7189, 231 Centennial Drive, University of North Dakota, Grand Forks, North Dakota 58202. Telephone: 701-777-3188; Email: myrna.olson@email.und.edu
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.

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</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>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of Instructional Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

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 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.

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 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 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 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 K-5 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 structures; 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. Superintendent 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 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.

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. 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. On demand.

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, communication, and critical theory. 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 treatments 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 methodologies. 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-profits 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. 1-8 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 advisor. 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.

HE 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 also will examine collegiate environments and how students’ person-environment interactions affect their development. On demand.

HE 509. Higher Education Management. 3 Credits.
This 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.
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 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 advisor and 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 Enrolment. 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. 6-18 Credits.
Prerequisite: Consent of the advisor. Repeatable to 18 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 Eyes. 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 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 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,SS.

SPED 557. Progress Monitoring/Specific 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 student 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.S.S.S.

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.S.S.

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 will examine 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.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 medication 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. S.S.

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.S.

SPED 567. ASD Assessment. 3 Credits.
This 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.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-reliance, 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.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. 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 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.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.S.S.

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.
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 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 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 557. Language Structure and Analysis for ELL Teachers. 3 Credits.
Prerequisite: 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 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-4: Liquid/Gas. 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, socioeconomics, linguistics and age, and considers educational implications for preservice and inservice teachers.

T&L 573. Middle School Science and Engineering Lab2: Liquid/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: Motion/Electric. 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 and academic poster and/or prepare a proposal of the Inquiry project for a professional setting. Prerequisites: T&L 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.

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 or advisor. Repeatable.

T&L 593. Independent Projects. 1-4 Credits.
Repeatable.

T&L 596. Independent Research in Education. 1-4 Credits.
Prerequisite: Consent of instructor and advisor. Repeatable.

T&L 955. 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 966. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

T&L 997. 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.

Educational Foundations and Research
http://www.und.edu/dept/efr/

FACULTY: C. Hunter, J. Hunter, LeMire, Stupnisky (Graduate Director) and M. Weaver-Hightower (Chair)

Degrees Granted: Master of Science in Educational Studies (M.S.), Doctor of Philosophy in Foundations and Research (Ph.D.)

The Department of Educational Foundations and Research provides programs for educators and other professionals interested in humanities and social sciences perspectives on education and/or educational research methods. The department is committed to the encouragement of interdisciplinary efforts and to increased understanding of our diverse society and social justice.

Students are admitted to this program following procedures established by the college.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Mission Statement and Program Goals
The mission of the department of Educational Foundations and Research is to deeply understand and find solutions for the challenges that face educators, leaders, and policymakers in our state and around the world. We do this through:

• rigorous interdisciplinary research that leverages cutting-edge theory and research methods in the humanities and social sciences;

• collaboration with the best minds in education and other disciplines;

• engaged, hands-on teaching that develops highly skilled, knowledgeable, and reflective professionals;

• committed service to our community, to North Dakota, to our region, and to the larger profession; and

• articulate, informed advocacy for evidence-based decision making, cultural understanding, and social justice.

The M. S. degree broadly prepares students in humanistic and social science perspectives on education, diversity, and research pertinent to many levels
and disciplines in pre-K–12 and higher education. The Ph.D. degree further prepares students for professional positions that rely on a full understanding of the broad intellectual and scholarly themes that are foundational to good practice, as well as excellent research skills. Ph.D. students study both the Foundations of Education as well as Research Methodologies, choosing to emphasize one or the other (see requirements under the Degrees section).

**Master of Science in Educational Studies (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. Minimum of 8 undergraduate credit hours of social sciences/humanities
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. Three letters of recommendation that address the academic and professional qualities that support you for graduate work
5. Statement of Goals and Objectives (see below)
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Statement of Goals and Objectives.** As part of the application process, the applicant must respond to the following questions:

1. 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.
2. What are the characteristics, attitudes, values, and/or skills that you think will make you a good candidate for your professional role?
3. What have you already done professionally or personally of which you are proud? Please include a chronological history of all professional teaching or administration experiences, as well as academic honors or achievements you have earned.

**Degree Requirements**

**A minimum of 32 credits, to include:**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EFR 500</td>
<td>Introduction to the Foundations of Education</td>
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<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
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<tr>
<td>Foundations</td>
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<td>Research Methods</td>
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<td>Curriculum, Instruction, and Leadership (HE, EDL or T&amp;L)</td>
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<td>Cognate or Minor</td>
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<tr>
<td>EFR 997</td>
<td>Independent Study M Ed &amp; M S</td>
<td>2-4</td>
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<tr>
<td>or EFR 995</td>
<td>Scholarly Project</td>
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<tr>
<td>or EFR 998</td>
<td>Thesis</td>
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Total Credits: 32-34

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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

<table>
<thead>
<tr>
<th>Course Code</th>
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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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<td>EFR 503</td>
<td>Historical Foundations of Education</td>
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<td>EFR 504</td>
<td>Philosophical Foundations of Education</td>
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<td>EFR 505</td>
<td>Sociological Foundations of Education</td>
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<td>EFR 506</td>
<td>Multicultural Education</td>
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<td>EFR 507</td>
<td>Gender, Sexuality and Education</td>
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<td>EFR 508</td>
<td>Anthropological Foundations of Education</td>
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<td>EFR 525</td>
<td>International and Comparative Education</td>
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<tr>
<td>EFR 591</td>
<td>Readings in Education (With advisor approval)</td>
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Select four of the following (Research): 12

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<tbody>
<tr>
<td>EFR 510</td>
<td>Qualitative Research Methods</td>
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<td>EFR 511</td>
<td>Program Evaluation</td>
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<td>EFR 512</td>
<td>Educational Tests and Measurements</td>
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<td>EFR 513</td>
<td>Large Dataset Analysis</td>
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<td>EFR 514</td>
<td>Discourse Analysis</td>
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<td>EFR 516</td>
<td>Statistics II</td>
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<td>EFR 517</td>
<td>Advanced Research Methodologies</td>
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<td>Multivariate Analysis</td>
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<td>EFR 520</td>
<td>Advanced Qualitative Research Methods</td>
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<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>
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<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>
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</table>

HIST 501    Methods of Historical Research          | 33

**Research Methodologies Emphasis**

Select seven of the following: 21

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>EFR 510</td>
<td>Qualitative Research Methods</td>
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<td>EFR 511</td>
<td>Program Evaluation</td>
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<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>
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<td>EFR 517</td>
<td>Advanced Research Methodologies</td>
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<td>Multivariate Analysis</td>
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<td>EFR 584</td>
<td>Internship in Educational Research</td>
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<td>EFR 590</td>
<td>Special Topics in Education</td>
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<tr>
<td>EFR 592</td>
<td>Individual Research in Education (With advisor approval)</td>
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</table>

HIST 501    Methods of Historical Research          | 9

Select three of the following (Foundations): 9

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>EFR 501</td>
<td>Psychological Foundations of Education</td>
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<tr>
<td>EFR 502</td>
<td>Issues and Trends in Education</td>
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<tr>
<td>EFR 503</td>
<td>Historical Foundations of Education</td>
</tr>
<tr>
<td>EFR 504</td>
<td>Philosophical Foundations of Education</td>
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<tr>
<td>EFR 505</td>
<td>Sociological Foundations of Education</td>
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<tr>
<td>EFR 506</td>
<td>Multicultural Education</td>
</tr>
<tr>
<td>EFR 507</td>
<td>Gender, Sexuality and Education</td>
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<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 590</td>
<td>Special Topics in Education</td>
</tr>
<tr>
<td>EFR 591</td>
<td>Readings in Education (With advisor approval)</td>
</tr>
</tbody>
</table>

**Total Credits** 30

**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.**
A 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 changeing 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. 1-8 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 adviser. 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.
Repeatable to 15 credits.

EFR 999. Dissertation. 1-15 Credits.

Educational Leadership

FACULTY: Brenda Kallio and Pauline Stonehouse

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 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 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 basic 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
EDL 501 Leadership and Organizational Behavior 3
EDL 503 Leadership Analysis and Assessment 1-3
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
EDL 519 Internship: Curricular and Administrative Leadership 2
EDL 520 Special Education Law 3
Select one of the following: 1
EDL 521 Elementary Principal Field Study
EDL 522 Secondary Principal Field Study
Select one of the following: 1-3
EDL 535 Administration of Elementary School Curriculum
EDL 536 Administration of Middle School Curriculum
EDL 537 Administration of Secondary School Curriculum
EDL 997 Independent Study

Research and Foundations/Cognate
EFR 500 Introduction to the Foundations of Education 3
EFR 509 Introduction to Educational Research 3
Electives 3
Total Credits 35-39

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
EDL 501 Leadership and Organizational Behavior 3
EDL 503 Leadership Analysis and Assessment 1-4
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
EDL 519 Internship: Curricular and Administrative Leadership 3
EDL 521 Elementary Principal Field Study
EDL 522 Secondary Principal Field Study
EDL 535 Administration of Elementary School Curriculum 1-3
EDL 536 Administration of Middle School Curriculum 1-3
EDL 537 Administration of Secondary School Curriculum 1-3

Required Courses in District Level Administration with a master’s degree in administration
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 571 School Community Relations 2

Foundations
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)
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
EDL 593 Internship in Educational Leadership *** 1-8

Independent Study
EDL 997 Independent Study 4

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
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, requiring those who have completed the role of 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>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EDL 501</td>
<td>Leadership and Organizational Behavior</td>
<td>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>
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<td>EDL 515</td>
<td>Education Law and Ethics</td>
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<td>EDL 516</td>
<td>Education Finance and Policy</td>
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Doctoral Core Courses

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<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>
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<tr>
<td>EDL 572</td>
<td>Educational Systems and Planning</td>
<td>2</td>
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<tr>
<td>EDL 573</td>
<td>Administration and Organizational Behavior I</td>
<td>3</td>
</tr>
<tr>
<td>EDL 575</td>
<td>Education and Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>EDL 579</td>
<td>Special Topics in Educational Leadership</td>
<td>12</td>
</tr>
</tbody>
</table>

EFR 500  Introduction to the Foundations of Education  3

Select three of the following:

- Psychological Foundations of Education (EFR 501)  9
- Issues and Trends in Education (EFR 502)
- Historical Foundations of Education (EFR 503)
- Philosophical Foundations of Education (EFR 504)
- Sociological Foundations of Education (EFR 505)
- Multicultural Education (EFR 506)
- Gender, Sexuality and Education (EFR 507)
- Anthropological Foundations of Education (EFR 508)

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

EDL 593  Internship in Educational Leadership  1-8

Dissertation

EDL 999  Dissertation  10

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:

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<td>Supervision and Staff Development</td>
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<td>Educational Systems and Planning</td>
<td>2</td>
</tr>
<tr>
<td>EDL 573</td>
<td>Administration and Organizational Behavior</td>
<td>3</td>
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<tr>
<td>EDL 575</td>
<td>Education and Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>EDL 579</td>
<td>Special Topics in Educational Leadership</td>
<td>12</td>
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</table>

Educational Leadership PK-12

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>EDL 523</td>
<td>The Educational Plant</td>
<td>3</td>
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<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>
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<td>EDL 529</td>
<td>Special Education Law</td>
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<tr>
<td>EDL 531</td>
<td>School District Leadership</td>
<td>2</td>
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<td>EDL 532</td>
<td>Staff and Program Evaluation</td>
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<td>EDL 571</td>
<td>School Community Relations</td>
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<tr>
<th>Foundations of Education</th>
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<td>Course Code</td>
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<td>EFR 500</td>
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Select one of the following:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EFR 501</td>
<td>Psychological Foundations of Education</td>
<td>3</td>
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<tr>
<td>EFR 502</td>
<td>Issues and Trends in Education</td>
<td>3</td>
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<td>EFR 503</td>
<td>Historical Foundations of Education</td>
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<td>EFR 504</td>
<td>Philosophical Foundations of Education</td>
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<td>EFR 505</td>
<td>Sociological Foundations of Education</td>
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<td>EFR 506</td>
<td>Multicultural Education</td>
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<td>EFR 507</td>
<td>Gender, Sexuality and Education</td>
<td>3</td>
</tr>
<tr>
<td>EFR 508</td>
<td>Anthropological Foundations of Education</td>
<td>3</td>
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</tbody>
</table>

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.

Scholarly Tools

Select from approved courses that provide the scholarly tools to support educational research

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDL 593</td>
<td>Internship in Educational Leadership</td>
<td>1-8</td>
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Dissertation

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<th>Course Title</th>
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<tbody>
<tr>
<td>EDL 999</td>
<td>Dissertation</td>
<td>12</td>
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</tbody>
</table>

Total Credits

96-120

* 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.

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 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 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 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 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 996. Continuing Enrollment, 1-12 Credits.
Repeatable. S/U grading.

EDL 997. Independent Study, 1-12 Credits.
Repeatable to 4 credits.

EDL 998. Thesis, 1-9 Credits.

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, Burris, Chalmers, Chiasson, Combs, Gallo, Goumeau, Grabe, Grave, Guy, W. Hung, Ingwalson, Jacobson, Johnson, Keengwe, Lee, Mahar, Olson, Onchhvari, Ozaki, Pearson, Salyers, Shafer, Smart, Terras, Van Eck, Walker, Yearwood and Zidon

Graduate Programs Offered in the Department of Teaching and Learning

<table>
<thead>
<tr>
<th>Doctoral Programs</th>
<th>Masters and Certificate Programs</th>
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<td>Teaching and Learning</td>
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<tr>
<td>Ed.D., Ph.D.</td>
<td>Education-General M.S.</td>
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<td>M.S.</td>
<td>Studies M.Ed., M.S.</td>
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<td>M.Ed., M.S.</td>
<td>English Language Education Certificate</td>
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<td>Certificate</td>
<td>Reading Education M.Ed., M.S.</td>
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<td>Special Education M.Ed., M.S.</td>
<td>Instructional Certificate (ASD)</td>
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<tr>
<td>Certificate</td>
<td>Design and Technology M.Ed., M.S.</td>
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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 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).
- **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 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.

**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 three 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 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.

**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 10 credits of dissertation, which incorporates independent work that is an original contribution to knowledge in the field
   - A minimum of 6 credits in the Foundations of Education
   - A minimum of 12 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 pursue will become a holistic and unified experience. (The residency option is normally described 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 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 Lan and 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 529. 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 various models of teaching: social interaction, information-processing, inquiry and behavioral. The purpose of the course is to include children birth to age eight.

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.

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-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 an 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 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.

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 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 adviser.

T&L 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

T&L 997. 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

http://education.und.edu/teaching-and-learning/grad-master-curriculum-instruction.cfm
FACULTY: Baker, Helgeson, Holen (Graduate Director), Ingwalson, Pearson, Rogers, Smart, Zidon

Degree Granted: Master of Science (M.S.)

Mission Statement and Program Goals

The Master of Science degree in Curriculum and Instruction is designed for K-12 educators and responds to issues and trends in schools today. This degree supports development of advanced skills in teaching students and assessing learning, developing curriculum, and conducting self-inquiry. The program’s constructivist approach strengthens professional awareness leading to problem-solving skills in an effort to reach potential solutions to current educational challenges.

Through this program you will:

• Design and implement student-centered curriculum and learning while attending to standards for various disciplines.
• Assess learners for academic achievement.
• Reflect on your educational practice.
• Examine diversity issues within the educational community.
• Conduct systematic classroom based research.
• Use appropriate technology to support teaching and learning.
• Communicate and collaborate with other educators.

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 in Education that leads to licensure at one of the following levels: early childhood education, elementary, middle or secondary education.
2. Cumulative undergraduate grade point average (GPA) of 2.75 or at least 3.00 GPA for the junior and senior years of undergraduate degree (based on A=4.0).
3. Applicants must satisfy the School of Graduate Studies’ English Language Proficiency requirements as listed in the Graduate Academic Information section of the graduate catalog. 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 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 506 Multicultural Education).
6. Five to six credits of scholarly tools (e.g., T&L 569 Action Research, T&L 579 Classroom Based Inquiry, 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</th>
<th>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>T&amp;L 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 998</td>
<td>Thesis</td>
<td>1-9</td>
</tr>
</tbody>
</table>

Electives for the Major (6 Credits from the following or courses approved by an advisor)

<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 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>
</tr>
<tr>
<td>T&amp;L 590</td>
<td>Special Topics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Research (6 credits from the following)

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<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>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://www.und.edu/dept/tl/ece/

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 follows 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.

1. An undergraduate degree in early childhood education, child development, elementary 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. Transcripts, recommendations for admission, and a personal statement, i.e., a response to three essay prompts, are part of the School of Graduate Studies and Early Childhood Education application procedure. The personal statement essay should be 2-3 pages in length and the prompts are:
   a. What have you already done professionally or personally of which you are proud? Please include a chronological history of all professional teaching and administration experience, as well as academic honors or achievements you earned.
   b. What are the characteristics, attitudes, values, and/or skills that you think will make you a good candidate for your professional role?
   c. 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

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 just 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:

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<tr>
<th>Major</th>
<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>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>
</tr>
<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
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<tr>
<td>or T&amp;L 998</td>
<td>Thesis</td>
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</table>

Scholarly Tools

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
<td>3</td>
</tr>
</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/grad-elem-ed.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 on-line. 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.

**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 II** 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>
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</thead>
<tbody>
<tr>
<td>T&amp;L 518</td>
<td>Science in the Elementary School</td>
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</tr>
<tr>
<td>T&amp;L 519</td>
<td>Social Studies in the Elementary School</td>
<td>3</td>
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<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>
</tbody>
</table>

**Electives**

- Depends on thesis or non-thesis option
- Recommended: 3-9

**Scholarly Tools**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
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</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
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**Other Required Coursework**

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<th>Title</th>
<th>Credits</th>
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<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>
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<tr>
<td>or T&amp;L 998</td>
<td>Thesis</td>
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**Total Credits**

- 24-37

**Major: Elementary Education (Track II)**

**Required Core Courses**

<table>
<thead>
<tr>
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<tbody>
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<td>1-4</td>
</tr>
</tbody>
</table>

**Electives**

- Depends on thesis or non-thesis option
- Recommended: 3-9

**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>
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<td>EFR Elective</td>
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**Other Required Coursework**

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</tr>
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<td>Independent Study</td>
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</table>
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

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<td>Cognate</td>
<td>Action Research (Recommended)</td>
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</tbody>
</table>

Total Credits: 24-37

English Language Learners (TESOL)


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 Masters degree program best meets their state requirements.

Details pertaining to admission and degree requirements can be found in the Degrees section.

Mission Statement and Program Goals

ELL teachers and other TESOL professionals who work with English Language Learners require specialized linguistic, socio-cultural, and pedagogical knowledge in order to provide effective instruction and assessment in the ELL classroom. The ELL teacher’s role, however, extends beyond the ELL classroom, and our program prepares graduates to become collaborators, leaders and advocates in the field of TESOL education. Flexibility in course assignments allows individuals to pursue their own scholarly interests in the field.

By the end of the program:
1. The student will demonstrate knowledge of the English language required for teaching ELLs.
2. The student will demonstrate knowledge of how people acquire and/or learn languages.
3. The student will demonstrate knowledge of models, strategies, methods and assessments for English acquisition in the four language domains.
4. The student will demonstrate knowledge of U.S. and global issues and challenges in ELL education.

The program is offered entirely on-line. Note: 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.

Master of Education (M.Ed.)

This degree is the highest academic credential normally held by teachers in the TESOL field. While the program focuses on K-12 education in the United States, the program is also responsive to those planning to teach adult ESL or teach English overseas. The program may be completed in six semesters. A 90-hour field experience is required in addition to a final scholarly project or independent study.

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:

   7. Major
      - T&L 523 Literacy Instruction for English Language Learners 3
      - T&L 514 Introduction to Multilingual Education 3
      - T&L 537 ELL Methods and Materials 3
      - T&L 550 Assessment and Evaluation in ELL Education 3
      - T&L 568 Research and Advocacy in TESOL 3
      - T&L 580 Practicum in Schools 3
      - T&L 995 Scholarly Project 2 or T&L 997 Independent Study
      - Cognate
      - T&L 513 Linguistics for ELL Teachers 3
      - T&L 567 Language Structure and Analysis for ELL Teachers 3
      - T&L 551 Second Language Acquisition for ELL Teachers 3
      - Foundations
      - EFR 500 Introduction to the Foundations of Education 3
      - EFR 506 Multicultural Education 3

   Total Credits 35

Higher Education

http://education.und.edu/educational-leadership/higher-education.cfm

FACULTY: Healy, Nguyen, Rice, 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:
- HE 500 Higher Education Orientation
- HE 501 Introduction to Higher Education
- HE 503 Diversity Across Higher Education
- HE 505 The College Student

Educational Foundations & Research:
- EFR 500 Introduction to the Foundations of Education
- EFR 509 Introduction to Educational Research
- T&L 541 History of Higher Education in the United States

Integrative Learning Experiences:
- HE 529 Capstone Seminar
- HE 997 Independent Study

Electives (Sampling of Potential Electives):
- HE 507 Collegiate Environments
- HE 509 Higher Education Management
- HE 511 Program Development
- HE 513 College Students and the Law
- HE 592 Internship in Higher Education

Total Credits: 35-42

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:

Minor/Master’s transfer credits (30 credits)

Higher Education Common Core (18 credits):
- HE 530 Orientation to Doctoral Study
- HE 532 Principles and Practices in Higher Education
- HE 536 Leading and Learning in Higher Education
- HE 538 College Student Experiences
- HE 549 Dissertation Orientation
- T&L 541 History of Higher Education in the United States
- T&L 543 Scholarly Writing

Educational Foundations (12 credits):
- Advanced Foundations elective 1
- Advanced Foundations elective 2
- Advanced Foundations elective 3
- Advanced Foundations elective 4

Scholarly Tools (6 credits):
- (Prerequisite: EFR 515 or equivalent)
- EFR 510 Qualitative Research Methods
- EFR 516 Statistics II

Administration Emphasis (20 credits):
- Core (9 credits):
- HE 563 Academic Administration in Higher Education
- HE 570 Higher Education Law
- HE 576 Higher Education Planning and Finance
- Electives (11 credits):
- Selected with consent of advisor

Individualized Emphasis (20 credits):
- Electives selected with consent of advisor and faculty from area of specialization
- Dissertation

Total Credits: 116

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 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 Foundations and Research.
6. Successful completion of a final examination.

Minor/Master’s transfer credits (24 credits)

Higher Education Common Core (18 credits):
- HE 530 Orientation to Doctoral Study 1
- HE 532 Principles and Practices in Higher Education 3
- HE 536 Leading and Learning in Higher Education 3
- HE 538 College Student Experiences 3
- HE 549 Dissertation Orientation 2
- T&L 541 History of Higher Education in the United States 3
- T&L 543 Scholarly Writing 3

Educational Foundations (6 credits):
- (Prerequisite: EFR 500 or equivalent) Advanced Foundations elective 1 3
- (Prerequisite: EFR 515 or equivalent) EFR 510 Qualitative Research Methods 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 OR

Individualized emphasis (18 credits):
Electives selected with consent of advisor and faculty from area of specialization

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 also will examine collegiate environments and how students’ person-environment interactions affect their development. On demand.

HE 509. Higher Education Management. 3 Credits.
This 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.
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 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 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 advisor and 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. 6-18 Credits.
Prerequisite: Consent of the advisor. Repeatable to 18 credits.

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 eLearning, 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 attendances, 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.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core coursework in IDT</td>
<td>9</td>
</tr>
<tr>
<td>Additional coursework in IDT area of emphasis</td>
<td>9</td>
</tr>
<tr>
<td>Foundations coursework in education and psychology</td>
<td>3</td>
</tr>
<tr>
<td>Scholarly tools/research</td>
<td>6</td>
</tr>
<tr>
<td>Internship</td>
<td>2</td>
</tr>
<tr>
<td>Scholarly project or thesis</td>
<td>2-4</td>
</tr>
<tr>
<td>Total (34-non-thesis or 36-thesis)</td>
<td></td>
</tr>
</tbody>
</table>

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.
3. **Foundations component:** Fundamental background in psychology.
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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course 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>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of Instructional Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

**Area of Emphasis**

Select three of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 550</td>
<td>Theories and Models of Instructional Design</td>
</tr>
<tr>
<td>IDT 590</td>
<td>Special Topics in Instructional Design and Technology</td>
</tr>
<tr>
<td>IDT 591</td>
<td>Readings in Instructional Design and Technology</td>
</tr>
</tbody>
</table>
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.
3. **Foundations component:** Fundamental background in psychology.
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**

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<tr>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
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<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>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of Instructional Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

**Area of Emphasis**

Select two of the following: 6

<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>3</td>
</tr>
<tr>
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<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>
<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>
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</table>

**Corporate Emphasis**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 560</td>
<td>Instructional Design Consulting</td>
<td>3</td>
</tr>
<tr>
<td>IDT 570</td>
<td>Human Performance Technology</td>
<td>3</td>
</tr>
<tr>
<td>IDT 530</td>
<td>Introduction to Computer-Based Instruction</td>
<td>3</td>
</tr>
<tr>
<td>IDT 535</td>
<td>Advanced Computer-Based Instructional Development</td>
<td>3</td>
</tr>
<tr>
<td>IDT 545</td>
<td>Instructional Simulations and Games</td>
<td>3</td>
</tr>
<tr>
<td>IDT 580</td>
<td>Introduction to Web-Based Instruction</td>
<td>3</td>
</tr>
</tbody>
</table>

**Foundations**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 501</td>
<td>Psychological Foundations Educ</td>
<td>3</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</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>IDT 592</td>
<td>Research in Instructional Design and Technology</td>
<td>1-3</td>
</tr>
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</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>
</tr>
</tbody>
</table>

**Scholarly Project**

Select one of the following: 2-4

<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>
<tr>
<td>IDT 998</td>
<td>Thesis</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Credits** 29-35

**Master of Education (MEd)**

**Admission Requirements**

The candidate must meet the School of Graduate Studies’ current minimum
general admission requirements as published in the graduate catalog.

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year grade point average of 3.00 for the Master of Education and Master of
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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:

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</tr>
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</table>

**Area of Emphasis**

Select two of the following: 6

<table>
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<tr>
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<tbody>
<tr>
<td>IDT 590</td>
<td>Special Topics in Instructional Design and Technology</td>
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**Corporate Emphasis**

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**Foundations**

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**Scholarly Tools**

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 592</td>
<td>Research in Instructional Design and Technology</td>
<td>1-3</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>
</tr>
</tbody>
</table>

**Scholarly Project**

Select one of the following: 2-4

<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>
<tr>
<td>IDT 998</td>
<td>Thesis</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Credits** 29-35

**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
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(live) class sessions, where students may attend on-campus in the actual
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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. 423) 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 seeking the full set of professional competencies of 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):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 520</td>
<td>Instructional Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Instructional Materials</td>
<td></td>
</tr>
</tbody>
</table>

Two Additional Courses from the Following (6 credits):

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<thead>
<tr>
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<tbody>
<tr>
<td>IDT 510</td>
<td>Technology-Based Instruction: Applications and</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td></td>
</tr>
<tr>
<td>IDT 540</td>
<td>Digital Media and the Internet in Schools</td>
<td>3</td>
</tr>
<tr>
<td>IDT 545</td>
<td>Instructional Simulations and Games</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits 12

IDT Certificate in eLearning

Required Courses (6 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 520</td>
<td>Instructional Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Instructional Materials</td>
<td></td>
</tr>
</tbody>
</table>

Two Additional Courses from the Following (6 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 530</td>
<td>Introduction to Computer-Based Instruction</td>
<td>3</td>
</tr>
<tr>
<td>IDT 545</td>
<td>Instructional Simulations and Games</td>
<td>3</td>
</tr>
<tr>
<td>IDT 580</td>
<td>Introduction to Web-Based Instruction</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits 12

IDT Certificate in Corporate Training and Performance

Required Courses (6 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 520</td>
<td>Instructional Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>IDT 525</td>
<td>Development, Implementation, and Evaluation of</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Instructional Materials</td>
<td></td>
</tr>
</tbody>
</table>

Two Additional Courses from the Following (6 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDT 545</td>
<td>Instructional Simulations and Games</td>
<td>3</td>
</tr>
<tr>
<td>IDT 580</td>
<td>Introduction to Web-Based Instruction</td>
<td>3</td>
</tr>
</tbody>
</table>

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, modalities, 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.

IDT 580. Introduction to Web-Based Instruction. 3 Credits.
This course trains students to design and develop web-based instruction, including basic web site design tools and theory, design and development of online learning with course management systems, supporting technologies in web-based instruction, pedagogical approaches to the design and development of online learning environments. Prerequisites: Program major or permission of instructor; IDT 520.

IDT 584. Internship in Instructional Design and Technology. 2-4 Credits.
The internship is a culminating experience in which the student assumes responsibility for an instructional design and technology project. Repeatable to 4 credits. Repeatable to 4 credits.

IDT 590. Special Topics in Instructional Design and Technology. 1-3 Credits.
An in-depth study of a selected topic in instructional design and technology. Topics will vary with faculty expertise and current issues. Some topics would include simulations, instructional applications of the World Wide Web, performance support systems, adaptive testing, intelligent tutoring systems, and hypermedia applications. Repeatable to 3 credits.

IDT 591. Readings in Instructional Design and Technology. 1-3 Credits.
Selected readings with oral and written reports. Repeatable to 3 credits.

IDT 592. Research in Instructional Design and Technology. 1-3 Credits.
Supervised research in areas of student interest. Repeatable to 3 credits.

IDT 593. Directed Studies in Instructional Design and Technology. 1-3 Credits.
Individual project work in the design and development of technology-based instruction. All projects will require a final report. Repeatable to 3 credits. Repeatable to 3 credits.

IDT 995. Scholarly Project. 2 Credits.
The scholarly project demonstrates critical analysis and application of information and experiences gained throughout the program of study.

IDT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

IDT 997. Independent Study. 2 Credits.
The independent study requires the student to investigate a topic related to the major field of study and to prepare a formal report summarizing this investigation.

IDT 998. Thesis. 4-9 Credits.
The thesis is an original research project completed. Repeatable to 9 credits. Repeatable to 9 credits.

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**Reading Education**


**FACULTY:** Barrentine (Graduate Director), Beck, Rogers, and Walker

**Degrees Granted:** Master of Science (M.S.) and Master of Education (M.Ed.)

The Reading Education programs are designed for educators interested in the study of individual readers and writers, reading/language arts instruction in the classroom and/or in the reading specialist setting, reading/language arts curriculum and assessment. A unique feature of these programs is that students become engaged in teaching literacy in a supervised practicum experience. With careful planning, licensed teachers take course work that meets the requirements for obtaining the North Dakota Reading Credential.

Teachers with a degree leading to licensure in education may pursue either the Master of Education or the Master of Science.

The Reading Education programs are 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 Reading Education, the Department of Teaching & Learning, EHD, UND, UND School of Graduate Studies, and NDUS. The Reading programs are approved by the North Dakota Education Standards and Practices Board.

The degrees are offered in two formats: online or a combination of online and on campus.

**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, 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 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

Tracks I and II 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. 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 Core Requirements for the Reading Education major, for both degree programs are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524</td>
<td>Reading in the Content Areas</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525</td>
<td>Writing in the Classroom</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 534</td>
<td>Basic Reading Diagnosis and Remediation</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 583</td>
<td>Reading Clinic (corequisite with T&amp;L 534)</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credits: 12

Note: All students also complete various requirements specified for their degree program, i.e., for either the M.Ed. or the M.S. Please see below.

The M.S. Reading Education degree program is available in two tracks. Track I, either thesis or non-thesis, is open to licensed persons who wish to follow a research-oriented program of study. Track I requires a minimum of five credits of scholarly tools coursework and allows a maximum of two credits of reading. Track II, available only in the non-thesis option, provides opportunity for non-licensed persons to study Reading Education at the graduate level. Track II requires a minimum of six credits of coursework in Foundations of Education. With careful planning, most M.S. Track I students can meet the course requirements of the North Dakota Reading Credential. The credit hours for the M.S., Reading Education consist of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524</td>
<td>Reading in the Content Areas</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525</td>
<td>Writing in the Classroom</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534</td>
<td>Basic Reading Diagnosis and Remediation</td>
<td>2</td>
</tr>
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</table>

Select two to five of the following: 6-13

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course 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 528</td>
<td>Children’s Literature in the Classroom</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 531</td>
<td>Early Literacy Development and Instruction</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 533</td>
<td>Reading in the Secondary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 536</td>
<td>Teaching Language Arts</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 590</td>
<td>Special Topics</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
<td>2-6</td>
</tr>
<tr>
<td>T&amp;L 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 998</td>
<td>Thesis</td>
<td>2</td>
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</table>

Scholarly Tools (Track I only)

Select two of the following: 5

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 502</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>EFR 503</td>
<td>Educational Foundations (Track II only)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 31-42

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 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

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
The credit hours for the M.Ed., Reading Education consist of:

- Dakota Reading Credential.

Planning, most students can meet the course requirements for the North Dakota Reading Credential. With careful planning, most students can meet the course requirements for the North Dakota Reading Credential. The program culminates in three areas: The major (reading education), cognate, i.e., coursework that supports 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 Core Requirements for the Reading Education major, for both degree programs are:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 583</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

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</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 525</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 583</td>
<td>2</td>
</tr>
<tr>
<td><strong>Select two of the following:</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>T&amp;L 523</td>
<td>Literacy Instruction for English Language Learners</td>
</tr>
<tr>
<td>T&amp;L 528</td>
<td>Children’s Literature in the Classroom</td>
</tr>
<tr>
<td>T&amp;L 531</td>
<td>Early Literacy Development and Instruction</td>
</tr>
<tr>
<td>T&amp;L 533</td>
<td>Reading in the Secondary School</td>
</tr>
<tr>
<td>T&amp;L 536</td>
<td>Teaching Language Arts</td>
</tr>
<tr>
<td>T&amp;L 590</td>
<td>Special Topics (Leadership in Literacy)</td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
</tr>
<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
</tr>
</tbody>
</table>

**Cognate**

<table>
<thead>
<tr>
<th>Sample choices</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
</tr>
<tr>
<td>T&amp;L 590</td>
<td>Special Topics (Differentiated Instruction)</td>
</tr>
<tr>
<td>T&amp;L 540</td>
<td>Theory and Philosophies of Curriculum in Schools</td>
</tr>
<tr>
<td><strong>Elementary Education Courses</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>T&amp;L 518</td>
<td>Science in the Elementary School</td>
</tr>
<tr>
<td>T&amp;L 519</td>
<td>Social Studies in the Elementary School</td>
</tr>
<tr>
<td>or T&amp;L 522</td>
<td>Mathematics in the Elementary School</td>
</tr>
<tr>
<td><strong>Early Childhood Education Courses</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>T&amp;L 526</td>
<td>Play in Development and Early Childhood Education</td>
</tr>
<tr>
<td>T&amp;L 529</td>
<td>Language Development &amp; Cognition in Children</td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</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</td>
<td>Introduction to the Foundations of Education</td>
</tr>
<tr>
<td><strong>Select one of the following:</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>EFR 506</td>
<td>Multicultural Education</td>
</tr>
<tr>
<td>EFR 501</td>
<td>Psychological Foundations of Education</td>
</tr>
<tr>
<td>EFR 502</td>
<td>Issues and Trends in Education</td>
</tr>
<tr>
<td>EFR 503</td>
<td>Historical Foundations of Education</td>
</tr>
<tr>
<td>EFR 504</td>
<td>Philosophical Foundations of Education</td>
</tr>
<tr>
<td>EFR 505</td>
<td>Sociological Foundations of 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><strong>Total Credits</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

### Special Education

[http://www.und.nodak.edu/dept/tl/specialed/](http://www.und.nodak.edu/dept/tl/specialed/)

**FACULTY:** Campoverde, Chiasson, Deaver, Grave, 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 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**

Our mission is to improve the quality of life for individuals with exceptionalities and their families worldwide through professional excellence and advocacy.

**Vision**

The Special Education Program area at the University of North Dakota works together and with others to ensure that individuals with exceptionalities are valued and included in all aspects of life. The Program is globally renowned for its expertise, leadership, and high quality teacher preparation in the field of special education.

**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 certification, 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

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.

General Special Education: The general specialization area is a "design your own program" option. Students can choose courses from all of the courses offered by the special education program.

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 551 Advanced Assessment/Special Needs Students 3
   SPED 557 Progress Monitoring/Special Needs Students 3
   SPED 558 Response to Intervention 2
   SPED 567 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:

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 583 Internship: Autism Spectrum Disorders 1-6

Elective Courses

Select nine of the following:

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 Autism Spectrum Disorder Intensive Early Intervention
<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>Behavior Management for Special Needs Students</td>
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<td></td>
</tr>
<tr>
<td>SPED 590</td>
<td>Special Topics in Special Education (Experimental Analysis of Behavior)</td>
<td></td>
</tr>
</tbody>
</table>

**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 555: Behavior Management for Special Needs Students
- EDL 529: Special Education Law
- SPED 558: Response to Intervention
- SPED 590: Special Topics in Special Education (Infant/Toddler Mental Health)

**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.

**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
- T&L 553: Collaborative Relationships: Home, School and Community
- SPED 555: Behavior Management for Special Needs Students
- EDL 529: Special Education Law

**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.

**General Special Education**

Note that there are no additional required courses. A minimum of 25 credits can be selected from the following courses:

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<thead>
<tr>
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<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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<td>SPED 501</td>
<td>Diseases and Function of the Eye</td>
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<td>SPED 502</td>
<td>Braille Reading and Writing</td>
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<td>SPED 503</td>
<td>Orientation and Mobility/Visually Impaired</td>
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<tr>
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<td>Communication Media and Methods/Visually Impaired</td>
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<td>SPED 505</td>
<td>Low Vision Assessment and Remediation</td>
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<tr>
<td>SPED 506</td>
<td>Introduction to Emotional Disorders</td>
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<tr>
<td>SPED 507</td>
<td>Introduction to Intellectual Disabilities</td>
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<td>Introduction to Learning Disabilities</td>
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<td>SPED 509</td>
<td>IEP Development</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 Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>SPED 512</td>
<td>Methods and Materials for Preschool Children with Special Needs</td>
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<tr>
<td>SPED 514</td>
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<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</td>
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<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
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<tr>
<td>SPED 555</td>
<td>Advanced Methods: Emotionally Disturbed</td>
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<td>SPED 556</td>
<td>Advanced Methods: Intellectual Disabilities</td>
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<tr>
<td>SPED 557</td>
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<td>SPED 558</td>
<td>Response to Intervention</td>
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<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 562</td>
<td>Autistic 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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<td>Special Topics in Special Education (Introduction to ABA)</td>
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<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
<td>3</td>
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</table>

**Gifted/Talented (GT)**

**Required Courses**
- SPED 522: Introduction to Gifted/Talented Education 3
- SPED 523: Assessment in Gifted/Talented Education 3
- SPED 524: Teaching Methods in Gifted/Talented Education 3
- SPED 584: Internship: Gifted/Talented 2-6

**Elective Courses**
Select five of the following: 15
- SPED 551: Advanced Assessment/Special Needs Students
- SPED 552: Inclusive Methods
- T&L 553: Collaborative Relationships: Home, School and Community
- SPED 557: Progress Monitoring/Special Needs Students
- SPED 578: Behavior Management for Special Needs Students
Strategist (SES)

Required Courses
- SPED 506 Introduction to Emotional Disorders 2
- SPED 507 Introduction to Intellectual Disabilities 2
- SPED 508 Introduction to Learning Disabilities 2
- SPED 551 Advanced Assessment/Special Needs Students 3
- SPED 554 Advanced Methods: Learning Disabilities 3
- SPED 555 Advanced Methods: Emotionally Disturbed 3
- SPED 556 Advanced Methods: Intellectual Disabilities 3
- SPED 586 Internship: Emotional Disturbance 2-6
- SPED 587 Internship: Intellectual Disabilities 2-6
- SPED 588 Internship: Learning Disabilities 2-6

Elective Courses
Select one of the following:
- 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 Autistic Spectrum Disorder
- SPED 578 Behavior Management for Special Needs Students
- EDL 529 Special Education Law

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
- SPED 500 Education of the Visually Impaired 3
- SPED 502 Braille Reading and Writing 2
- SPED 505 Low Vision Assessment and Remediation 2
- SPED 585 Internship: Visual Impairment 2-6

Elective Courses
Select six of the following:
- SPED 501 Diseases and Function of the Eye
- SPED 503 Orientation and Mobility/Visually Impaired
- SPED 504 Communication Media and Methods/Visually Impaired
- SPED 506 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
- SPED 590 Special Topics in Special Education (Braille Code)
- EDL 529 Special Education Law

Additional credits from the other specialization areas

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.

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 five of the following:
- 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

Additional credits from the other specialization areas

Total Credits 25-29

* 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.

Intellectual Disabilities (ID)

Required Courses
- SPED 507 Introduction to Intellectual Disabilities 2
- SPED 551 Advanced Assessment/Special Needs Students 3
- SPED 555 Advanced Methods: Intellectual Disabilities 3
- SPED 588 Internship: Intellectual Disabilities 1-6

Elective Courses
Select six of the following:
- 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 586 Internship: Intellectual Disabilities 2-6
- SPED 587 Internship: Intellectual Disabilities 2-6
- SPED 588 Internship: Learning Disabilities 2-6

Additional credits from the other specialization areas

Total Credits 24-29

* If seeking special education endorsement in ID 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.:

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<td>T&amp;L 553</td>
<td>3</td>
</tr>
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<td>SPED 552</td>
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</table>

6. 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**

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**Elective Courses**

Select nine of the following: 18

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**Total Credits** 25-30

### Early Childhood Special Education (ECSE)

**Required Courses**

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**Elective Courses**

Select six of the following: 15

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<td>EDL 529</td>
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**Total Credits** 25-30

* 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.

### Emotional Disturbance (ED)

**Required Courses**

<table>
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**Elective Courses**

Select five of the following: 15

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<td>EDL 529</td>
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**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.

### Gifted/Talented (GT)

**Required Courses**

<table>
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**Elective Courses**

Select five of the following: 15

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</table>

**Total Credits** 25-30

* 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.
Learning Disabilities (LD)

Required Courses

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<th>Title</th>
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<tr>
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<td>Introduction to Learning Disabilities</td>
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</tr>
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<td>SPED 551</td>
<td>Advanced Assessment/Special Needs Students</td>
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<tr>
<td>SPED 554</td>
<td>Advanced Methods: Learning Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 587</td>
<td>Internship: Learning Disabilities</td>
<td>1-6</td>
</tr>
</tbody>
</table>

Elective Courses

Select six of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 509</td>
<td>IEP Development</td>
</tr>
<tr>
<td>SPED 521</td>
<td>Transition to Adult Life</td>
</tr>
<tr>
<td>SPED 528</td>
<td>Advanced Assistive Technology</td>
</tr>
<tr>
<td>SPED 552</td>
<td>Inclusive Methods</td>
</tr>
<tr>
<td>T&amp;L 553</td>
<td>Collaborative Relationships: Home, School and Community</td>
</tr>
<tr>
<td>SPED 557</td>
<td>Progress Monitoring/Special Needs Students</td>
</tr>
<tr>
<td>SPED 558</td>
<td>Response to Intervention</td>
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<tr>
<td>SPED 560</td>
<td>Introduction to Autistic Spectrum Disorder</td>
</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
</tr>
<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
</tr>
</tbody>
</table>

Additional credits from the other specialization areas

Total Credits 25-29

* 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</th>
<th>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>
<td>2-6</td>
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</tbody>
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Elective Courses

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<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
</tr>
<tr>
<td>EDL 529</td>
<td>Special Education Law</td>
</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</th>
<th>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>Braile 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>
</tr>
</tbody>
</table>

Elective Courses

Select six of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 501</td>
<td>Diseases and Function of the Eye</td>
</tr>
<tr>
<td>SPED 503</td>
<td>Orientation and Mobility/Visually Impaired</td>
</tr>
<tr>
<td>SPED 504</td>
<td>Communication Media and Methods/Visually Impaired</td>
</tr>
<tr>
<td>SPED 509</td>
<td>IEP Development</td>
</tr>
<tr>
<td>SPED 521</td>
<td>Transition to Adult Life</td>
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<td>Advanced Assistive Technology</td>
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<td>SPED 558</td>
<td>Response to Intervention</td>
</tr>
<tr>
<td>SPED 578</td>
<td>Behavior Management for Special Needs Students</td>
</tr>
<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>
</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.
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 adoptions 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.

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.

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.

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.

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.

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.S,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 medication 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. 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. Repeatable to 3 credits.

SPED 566. Autistic Spectrum Disorder Intensive Early Intervention. 3 Credits.
This is an elective course in the sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD) birth to age six. The 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 different methods and tools commonly used with individuals with ASD: specifically standardized assessments, checklists, rating scales, structured observation tools, and curricular based assessments. The 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. Repeatable to 6 credits.

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-reliance, 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 6 credits. Repeatable to 8 credits. Repeatable to 8 credits.

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 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. Prerequisite: Consent of instructor. Repeatable to 6 credits.

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. Repeatable to 6 credits.

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 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. Repeatable to 6 credits.

SPED 592. 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 959. 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. Repeatable.

Engineering

http://www.und.edu/dept/sem/

Faculty: Alshami, Ames, Bandypadhyay, Bibel, Bowman, Cavalli, Faruque, Fazel-Rezai, Geda, Grewal, Gullicks, Gupta, Ho, Jabbari, Jerath, Ji, Kaabouch, Kolodka, Kirshnamoorthy, Lim, Ling, Lindseth, Mamaghani, Mann, Moretti, Nejadpak, Neubert, Noghanian, Ostadhassan, Rabiei, Ranganathan, Rasouli, Salehfar (Program Director), Seams, Semke, Suleiman, Tande, Tang, Tavakolian, Wang, Wills, Yang, and Zahr.

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, electrical engineering, environmental engineering, geology, 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.

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 in the general section of this graduate catalog. The coursework shall include the Seminar in Engineering must be taken.
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.

Students admitted to an engineering M.S. 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. 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 for the specific track the student wishes to enter. Passing this exam will advance the student to Approved Status in the Doctoral Program in Engineering.

**Financial Assistance**

Financial aid in the form of teaching assistantships, research assistantships, fellowship, and internships are available on a competitive basis. Students seeking financial aid should complete their applications by February 15 for Fall admission and September 15 for Spring admission. Transcripts of previous college work, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.

**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 major 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 Director of the Engineering Program 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 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 at least 18 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 shall 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.

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.

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.

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 a 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 energy 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 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

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.

Chemical Engineering

http://www.engineering.und.edu/che
**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, having the skills required to formulate, assess, and document a hypothesis.

**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.)

#### 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://currprocess.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.

#### 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>
<tr>
<td></td>
<td>At least 21 credits of coursework from chemical engineering and related fields, which may include a minor or cognate.</td>
<td>21</td>
</tr>
</tbody>
</table>

#### Total Credits: 30

**Non-Thesis Option:**

- A minimum of 32 credits, including credits granted for independent study.
- 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.
- Preparation of a written independent study report approved by the faculty advisor.
- Comprehensive final examination.

#### Required Courses

<table>
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<tr>
<td>CHE 562</td>
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<tr>
<td>CHE 591</td>
<td>Research</td>
<td>3</td>
</tr>
<tr>
<td>CHE 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>At least 24 credits of coursework from chemical engineering and related fields.</td>
<td>24</td>
</tr>
</tbody>
</table>

#### Total Credits: 32

### Master of Engineering (M.Eng.)

#### Admission Requirements

The applicant must meet the Graduate School’s 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/MEng degree should see the “Chemical Engineering Combined Degree (https://currprocess.und.edu/engineeringandmines)” section for additional details.
2. An overall undergraduate GPA of at least 2.50 or a GPA of 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.

#### 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.

1. A minimum of 30 semester credits with at least 15 credits of chemical engineering at the 500-level.
2. At least 15 credits in engineering design, including either CHE 511 Advanced Chemical Engineering Kinetics or CHE 512 Transport Of Mass, CHE 595 Design Project (3 credits), and 9 credits selected from approved engineering design courses.
3. At least 15 credits of basic and engineering science, including at least 3 credits of chemistry, 3 credits of chemical engineering, 3 credits of mathematics, and 3 credits of chemistry, chemical engineering, or mathematics.
4. A maximum of nine semester credits may be transferred from another institution.
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.

CHE 501. Advanced Transport Phenomena. 3 Credits.
CHE 509. Advanced Chemical Engineering Thermodynamics. 3 Credits.
CHE 511. Advanced Chemical Engineering Kinetics. 3 Credits.
CHE 515. Design of Engineering Experiments. 3 Credits.
CHE 562. Seminar in Chemical Engineering. 3 Credits.
CHE 599. Dissertation. 12 Credits.

Total Credits: 93-111

Courses

CHE 501. Advanced Transport Phenomena. 3 Credits.
This course is designed to give an advanced treatment of momentum, heat, and mass transfer suitable for graduate students in chemical engineering, mechanical engineering, and environmental engineering. This course will involve using advanced mathematics to model transport systems of importance in engineering science and design. Prerequisites: CHE 301 and MATH 266. S, even years.

CHE 503. Fuels Technology. 3-4 Credits.
Processing and utilization of low rank fuels.
CHE 504. Air Pollution Control. 3 Credits.
Identification of major air pollutants from stationary and mobile sources and methods of controlling their emissions; dispersion of air pollutants in the atmosphere; photochemical air pollution; federal and state regulations. Prerequisite: Background equivalent to CHEM 122, MATH 265, and PHYS 252 is expected.
CHE 505. Biochemical Engineering. 3 Credits.
Principles of biochemical engineering and methods for the analysis, design, operation, and monitoring of biochemical engineering processes and reactors. Application to biochemical engineering research. Prerequisite: CHE 321 or consent of instructor.

CHE 507. Advanced Unit Operations. 3-6 Credits.
One or more of the following: fluid flow, heat flow, evaporation, humidification and dehumidification, drying, gas absorption, distillation, and extraction. Prerequisite: Background equivalent to CHE 405 is expected.

CHE 508. Advanced Unit Operations. 3-6 Credits.
Continuation of the first semester's work in advanced unit operations.
CHE 509. Advanced Chemical Engineering Thermodynamics. 3 Credits.
Chemical Engineering processes from the standpoint of quantitative thermodynamics. Special emphasis on thermodynamics of chemical reactions. Prerequisite: Background equivalent to CHE 303 is expected. F, even years.

CHE 510. Advanced Chemical Process Control. 3 Credits.
Analysis and design of advanced chemical process control systems including: dead time compensation, feed forward and adaptive control, multivariable control, digital computer control and the use of Z-transforms to get the discretetime dynamic response of chemical process systems. Prerequisites: MATH 266 and CHE 408 or equivalents approved by the department.

CHE 511. Advanced Chemical Engineering Kinetics. 3 Credits.
Theory and practice of industrial chemical reactor design. Advanced topics in kinetics of industrial chemical reactors. Prerequisite: Background equivalent to CHE 421 is expected.

CHE 512. Transport Of Mass. 3 Credits.
Prerequisites: Background equivalent to CHE 305, CHE 321, and MATH 265 is expected.

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. S.

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. F.

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. F.

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. F.

CHE 562. Seminar in Chemical Engineering. 1 Credit.
Conferences and reports on current developments in Chemical Engineering. Repeatable to 3 credits. S/U grading.
The Department of Civil Engineering offers graduate programs leading to the Master of Science degree in Civil Engineering, 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. Graduate students 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 intention 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. 607) 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. 607) 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:

<table>
<thead>
<tr>
<th><strong>Soils-Structures Option</strong></th>
<th><strong>Course Title</strong></th>
<th><strong>Credits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 501</td>
<td>Mechanics of Materials II</td>
<td>3</td>
</tr>
<tr>
<td>CE 502</td>
<td>Structural Stability</td>
<td>3</td>
</tr>
<tr>
<td>ME 529</td>
<td>Advanced Finite Element Methods</td>
<td>3</td>
</tr>
<tr>
<td>CE 595</td>
<td>Design Project</td>
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<tr>
<th><strong>Environmental Option</strong></th>
<th><strong>Course Title</strong></th>
<th><strong>Credits</strong></th>
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<tr>
<td>CE 531</td>
<td>Environmental Engineering III</td>
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<td>CE 532</td>
<td>Environmental Engineering IV</td>
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<td>CE 533</td>
<td>Industrial Wastes</td>
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<td>or CE 535</td>
<td>Hazardous Waste Management</td>
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<tr>
<td>CE 595</td>
<td>Design Project</td>
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<td>Electives</td>
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<td>CE 524</td>
<td>Open Channel Hydraulics</td>
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<td>CE 525</td>
<td>Surface Hydrology</td>
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<td>or GEOE 417</td>
<td>Hydrogeology</td>
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<th><strong>General Civil Engineering Option</strong></th>
<th><strong>Course Title</strong></th>
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<td>CE 501</td>
<td>Mechanics of Materials II</td>
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<td>CE 523</td>
<td>Applied Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>CE 531</td>
<td>Environmental Engineering III</td>
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<td>Electives</td>
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### 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 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 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 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.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" 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 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.
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 asphalt; 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 rainfall and flood frequency analysis, regionalization; runoff generation, routing, 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, meal, 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 elastoplastic 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 the PhD in Civil Engineering Program. 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.
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 998. Thesis. 1-9 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.

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 434. Environmental Engineering Laboratory. 4 Credits.
Physical, chemical and biological methods used in environmental engineering, water chemistry, instrumental methods, lab tours. On demand.

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.

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### Electrical Engineering

http://www.ee.und.edu/

Faculty: Faruque, Fazel-Rezai, Kaabouch, Lindseth, Nejadpak, Noghianian, Ranganathan, Salehfar, and Tavakolian

**Degrees Granted:**
- Master of Science (M.S.), Master of Engineering (M.Engr.)
- Doctor of Philosophy (Ph.D.)

The Department of Electrical Engineering offers graduate programs leading to a Master of Science (M.S.), a Master of Engineering (M.Engr.) and a Doctor of Philosophy degree. The M.S. degree is offered both on campus and online and offers the thesis and 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 the completion of an engineering design project.

The Department also offers combined programs, including a Bachelor of Science in Electrical Engineering (BSEE)/Master of Science in Electrical Engineering (M.S.E.E.) and a B.S.E.E./M. Engr. The intent of the combined programs is to allow qualified students to complete requirements for both degrees in one year beyond that required to receive the baccalaureate degree. Students may apply for this program upon completion of 95 credits toward the Bachelor's degree.

The Department of Electrical Engineering maintains strong research emphases in applied electromagnetics, antenna design, biomedical signal and image processing, biomedical device design, cognitive radio, microwave and radar engineering, mobile health-monitoring, neural and cardiovascular engineering, power electronics, renewable energy systems, sensor networks, signal and image processing, smart grid modeling, unmanned aerial systems, and wireless communications. Additionally, the department participates in the school-wide Ph.D. in Engineering program. The research programs, laboratory facilities, close student-faculty interaction, and strong mentoring and academic advising facilitate an environment of scholarly activity and prepare students for corporate and government positions in research and development.

Details pertaining to admission requirements, degree requirements and courses offered can be found in Degrees.

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**Mission Statement and Graduate 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.

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**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 students (thesis option). Students can repeat this class to the maximum number of three times.
11. At least two peer-reviewed conference, journal, or patent applications (as the 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.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 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).
   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, 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 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 Electrical 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 Electrical 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 Electrical 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 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 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 EE 570-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 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 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. 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.

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 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 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/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.

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 computer’s 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 biopotentials, 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 995. 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 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

EE 997. Independent Study. 2 Credits.

EE 998. Thesis. 1-6 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

Faculty: Alshami, Ames, Bowman, Cavalli, Gosnold, Grewal, Ji, Kolodka, Krishnamoorthy, Mann (Graduate Program Director), Putkonen, Salehfar, Seames, Tande, Wills and Zahui

Degrees Granted: Master of Science (M.S.), Master of Engineering (M.Engr.) and Doctor of Philosophy (Ph.D.) in Energy Engineering

Responding to climate change, rising energy costs, and security issues facing society, the College of Engineering and Mines offers a Master of Science and a Master of Engineering degree in Energy Systems Engineering. These degree programs continue UND’s tradition as a world leader in energy-related research and education. The Energy Systems Engineering program educates graduate students in the growing field of 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 and implement new energy systems. Research projects provide focused, experiential learning in areas of energy systems engineering. Projects are often conducted through our interdisciplinary Institute for Energy Studies; 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 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 and implement new energy systems. Graduates from this program are expected to find employment in the emerging renewable energy economic sector as well as in the more traditional utilities industry and supporting engineering companies. The M.S. degree is the most common option in the Energy Systems Engineering program.

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 Energy Systems Engineering Master of Science program is to equip students for careers conducting research and development activities in sustainable energy fields, or to pursue 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 Energy Systems 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 energy engineering.
Mission Statement and Program Goals

The objective of the Energy Systems Engineering Master of Engineering program is to equip students for careers designing and implementing energy technologies 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 student with an emphasis on sustainable energy engineering design.

Goal 1: Graduates will have mastered selected topics in Energy Systems 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 energy engineering problems.

Goal 3: Graduates will be well prepared for a career in industry or government in energy engineering.

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 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.

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 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.)

Mission Statement and Program Goals

The objective of the Energy Systems Engineering Master of Engineering program is to equip students for careers designing and implementing energy technologies 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 student with an emphasis on sustainable energy engineering design.

Goal 1: Graduates will have mastered selected topics in Energy Systems 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 energy engineering problems.

Goal 3: Graduates will be well prepared for a career in industry or government in energy engineering.

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, or 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:
   CHE 551 Research 3 - 5
   CHE 998 Thesis 4
   At least 21 credits of coursework from energy systems engineering and related fields, which may include a minor or cognate 21 - 23

Total Credits 28-32

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:
   CHE 591 Research 4 - 6
   CHE 997 Independent Study 2
   At least 24 credits of coursework from energy systems engineering and related fields 24 - 26

Total Credits 30-34

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 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
   CHE 595 Design Project 6 - 8
   CHE 997 Independent Study 2
At least 22 credits of coursework from energy systems engineering and related fields, which may include a minor or cognate, with at least 15 of these credits in engineering design-related courses as approved by the graduate program director.  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHE 503</td>
<td>Fuels Technology</td>
<td>3</td>
</tr>
<tr>
<td>CHE 504</td>
<td>Air Pollution Control</td>
<td>3</td>
</tr>
<tr>
<td>CHE 515</td>
<td>Design of Engineering Experiments</td>
<td>3</td>
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<tr>
<td>CHE 520</td>
<td>Impurities in Combustion and Gasification Systems</td>
<td>3</td>
</tr>
<tr>
<td>CHE 535</td>
<td>Metallic Corrosion and Polymer Degradation</td>
<td>3</td>
</tr>
<tr>
<td>EE 423</td>
<td>Power Systems I</td>
<td>3</td>
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<tr>
<td>EE 522</td>
<td>Renewable Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 523</td>
<td>Power Systems II</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 501</td>
<td>Energy, Resources and Policy</td>
<td>3</td>
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<tr>
<td>ENGR 502</td>
<td>Alternative Energy Systems</td>
<td>3</td>
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<tr>
<td>ME 464</td>
<td>Computational Fluid Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 545</td>
<td>Fluidized-Bed Combustion Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 562</td>
<td>Seminar in Chemical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>CHE 591</td>
<td>Research</td>
<td>1-15</td>
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<tr>
<td>CHE 595</td>
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<td>CHE 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>CHE 998</td>
<td>Thesis</td>
<td>1-9</td>
</tr>
</tbody>
</table>

**Total Credits:** 30-34

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.

The research-to-commercialization life cycle and evaluation methods are examined in depth using sustainable energy technologies as specific case studies.

### 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 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.

**Required Courses:**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENVE 562</td>
<td>Seminar in Environmental Engineering (1 credit per semester)</td>
<td>2</td>
</tr>
<tr>
<td>ENVE 591</td>
<td>Environmental Engineering Research</td>
<td>3</td>
</tr>
<tr>
<td>CHE 501</td>
<td>Advanced Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>CHE 504</td>
<td>Air Pollution Control</td>
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<tr>
<td>CHE 512</td>
<td>Transport Of Mass</td>
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<tr>
<td>CE 531</td>
<td>Environmental Engineering III</td>
<td>3</td>
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<tr>
<td>CE 532</td>
<td>Environmental Engineering IV</td>
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<tr>
<td>CE 535</td>
<td>Hazardous Waste Management</td>
<td>3</td>
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<tr>
<td>GEOE 417</td>
<td>Hydrogeology</td>
<td></td>
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<tr>
<td>GEOL 540</td>
<td>Water Sampling and Analysis</td>
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<tr>
<td>ENVE 998</td>
<td>Thesis</td>
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</tbody>
</table>
Additional requirements include:

general admission requirements as published in the graduate catalog.

Admission Requirements

of Graduate Studies’ as well as particular requirements set forth by the North Dakota must satisfy all general requirements set forth by the School Students seeking the Master of Engineering degree at the University of Degree Requirements

General admission requirements as published in the graduate catalog. The applicant must meet the School of Graduate Studies’ current minimum Master of Engineering (M. Engr.) 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 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.

The courses taken in a previously completed Environmental Engineering Certificate Program may be applied to a Master’s degree in Engineering.

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.

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.
Courses

ENVE 562. Seminar in Environmental Engineering. 1 Credit.
Conferences, seminars, and reports on current developments in environmental engineering. Students will participate in professional presentations on topics relevant to environmental engineering. Students will also report the results of their graduate research or present information on other technically relevant topics approved by the course instructor. Repeatable.

ENVE 590. Special Topics in Environmental Engineering. 1-3 Credits.
Topics of current interest. Repeatable. Repeatable.

ENVE 591. Environmental Engineering Research. 1-6 Credits.
Supervised research work in environmental engineering. Repeatable to 24 credits. Repeatable to 24 credits.

ENVE 595. Design Project. 3-6 Credits.
Engineering design experience involving individual effort and formal written report and presentation.

ENVE 996. Continuing Enrollment. 1-12 Credits.
Repeatable. SU grading.

ENVE 998. Thesis. 1-9 Credits.
Development and documentation of scholarly activity demonstrating proficiency in Environmental Engineering at the master's level. Repeatable to 9 credits. Repeatable to 9 credits. F,S,SS.

Geological Engineering

http://www.geology.und.edu/

Faculty: Forsman, Gerla, Gosnold, Hartman, Ho, LeFever, Mahmood, Matheney, Nordeng, Perkins, Pulkonen and Wang

Degrees Granted: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

The Master of Science in Geological Engineering includes both a thesis and non-thesis option. Students completing the non-thesis option will be highly qualified professionals capable of working in applied engineering fields. Students completing the thesis option will possess the necessary research skills to pursue a terminal degree, such as the Ph.D. in Engineering, offered at UND.

The Harold Hamm School of Geology and Geological Engineering also offers a program leading to a combined Bachelor of Science (B.S.) and Master of Science (M.S.) degree in Geological Engineering. The College of Engineering and Mines also offers a Ph.D. program in Engineering that geological engineers may elect to pursue.

Details pertaining to Harold Hamm School admission requirements, degree requirements and courses offered can be found by clicking on the links to the Degrees and Courses sections (above).

Master of Science (M.S.)

Mission Statement and Program Goals

The mission of the Master of Science in Geological Engineering is to develop the student into a highly qualified engineer capable of conducting research and solving complex problems related to petroleum and geothermal energy, mineral production, geoenvironmental concerns, and natural hazards.

Goal 1: Program graduates shall have sufficient skills in geoscience, mathematics, computer modeling, and poro-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.

Master of Science (M.S.) in Geological Engineering

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog. Additionally:

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 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 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOE 998. Thesis. 1-9 Credits.

Undergraduate Courses for Graduate Credit

GEOE 323. Engineering Geology. 4 Credits.
Application of geological and environmental principles to geotechnical engineering design, construction, and operation. Prerequisites: One introductory geology course, MATH 165 and upper division standing in geology or engineering. On demand.

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 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. Short programs using the finite difference method will be written to demonstrate groundwater movement and storage. Simulation of practical groundwater problems will be carried out using the U.S. Geological Survey's MODFLOW code. Prerequisites: GEOE 417 and MATH 265; some programming experience is recommended. F.

GEOE 455. Geomechanics. 3 Credits.
Principles of geomechanics and its application to petroleum and geological engineering. Prerequisites: GEOE 323 or consent of instructor. F.

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: GEOE 417 and GEOE 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 556. 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 570. 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: 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 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
design engineering 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. 607)” 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 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 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 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.)

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 Mechanical 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.

**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 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. 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 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.

**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 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 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.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. 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.M.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 Mechanical 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 Mechanical 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 Mechanical 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 Mechanical 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 ME 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 Mechanical Engineering (or relevance courses with the consent of the student’s advisor and advisory committee) coursework selected from the approved list of ME Ph.D. courses published in the UND Academic Catalog. Equivalent graduate level coursework may be transferred from a master’s program.

8. Successful completion of 4 written qualifying examinations, 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
   - Solid Mechanics
   - Controls
   - Fluid Mechanics
   - Dynamics
   - Heat Transfer
   - Materials Science
   - Manufacturing
   - Robotics

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 PhD 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 failing 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.

9. After successful completion of the qualifying 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. ME 562 – Graduate Seminar may serve as the venue for the annual oral progress reporting.

10. PhD students will complete a preliminary examination 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.

11. 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 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.

12. 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.

13. At least one peer reviewed journal article (as the first author) and one conference paper (as the first author) must be submitted with the consent of the advisor prior to graduation.

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, gyrodynamic, 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.**
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 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 200 with a grade of C or better, MATH 166 with a grade of C or better, 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 support of 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 layer with and without acceleration, turbulence modeling, wakes and jets. The laboratory provides experience in building grids using the program GAMBIT, the solid/liquid 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

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, such as conference paper, journal paper or patent application) 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 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 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 students (thesis option). Students can repeat this class to the maximum number of three times.

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.
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 shall 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.
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 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 an 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). 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.

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.

Certificate in Petroleum Engineering

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:

   - Earth Dynamical and Geophysics
   - Formation Evaluation
   - Petroleum Fluid Properties
   - Well logging
   - Reservoir Engineering
   - Drilling Engineering
   - Advanced Reservoir
   - Advanced Drilling
   - Numerical Reservoir Simulation
   - Petroleum Geomechanics

2. A minimum GPA of 3.00 is required to earn the certificate.

Courses

PTRE 511. Advanced Petroleum Engineering Labs. 4 Credits.
Studying the major hi-tech research equipment for petroleum reservoir characterization, such as: X-Ray Diffraction, X-Ray Fluorescence, Scanning Electron Microscope, Advanced Multifunctional 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 operation 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, odd 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. F, even 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. Exploration methods in Petroleum Engineering. 3 Credits.
This multidisciplinary course addresses different topics in exploration workflow 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 4 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. 4-9 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, Basgier, Beard, Carson, Conway, Czerwiec, Dixon, Donehower, Flynn, Harris, Huang, Kitzes, Koepke, Nelson (Graduate Program
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 graduate 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 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 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). Applicants who plan to major in creative writing should also submit an analytical paper.
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:
9. Required courses:
   - 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 3
   Electives 14-17
   - ENGL 998 Thesis 4
   Total Credits 29-32

**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:
9. Required courses:
   - 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 3
   - ENGL 598 Portfolio Workshop 3
   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. Required courses:
   - ENGL 590 Readings 1-4
   - ENGL 591 Readings for Ph.D. Comprehensive Examinations 1-4
   - ENGL 593 Research 1-4
4. Evidence of the mastery of scholarly tools appropriate to the proposed field of studies is required, including proficiency in EITHER one language other than English to Level VI OR Level IV proficiency in two languages other than English.

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.
The practicum part of English 501. Required of Graduate Teaching Assistants in English, S/U grading.

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.

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.

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 998. Thesis. 1-4 Credits.
Repeatable to 15 credits.

Undergraduate Courses for Graduate Credit

ENGL 401. Studies in Medieval Literature. 3 Credits.
A course in the literature of England in the medieval period. Repeatable when topics vary. F, even years.

ENGL 403. Studies in Colonial American Literature. 3 Credits.
A course in the literature of America in the colonial period. Repeatable when topics vary. Repeatable. F, even years.

ENGL 404. Studies in Renaissance Literature. 3 Credits.
A course in the literature of the English Renaissance. Repeatable when topics vary. Repeatable. S, odd years.
ENGL 405. Studies in Restoration and Eighteenth Century Literature. 3 Credits.
A course in the English literature of the Restoration and 18th century. Repeatable when topics vary. Repeatable. S. even years.

ENGL 406. Studies in Nineteenth Century Literature. 3 Credits.
A course in literature in English of the 19th Century. Repeatable when topics vary. Repeatable. F.S.

ENGL 407. Studies in Twentieth Century Literature. 3 Credits.
A course in literature in English of the 20th Century. Repeatable when topics vary. Repeatable. F.S.

ENGL 408. Advanced Composition. 3 Credits.
Intensive work in advanced writing in English Studies or other professional fields. Prerequisite: ENGL 120 or ENGL 125 or ENGL 130. S.

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 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 417. Special Topics in Language. 1-4 Credits.
A course for advanced students on topics varying from year to year. Repeatable. Repeatable. F.

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, Hansen, Munski (Graduate Director), Niedzielski, Rundquist, Todhunter, Vandeberg (Chair) and Wang (Director Certificate in Geographic Information Science)

Degrees Granted: Master of Science (M.S.), Master of Arts (M.A.) and Certificate in Geographic Information Science (GiSc)

The Geography 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 (cartography, GIS, and remote sensing of the environment). 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’s Masters 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’s Masters 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:
   - GEOG 500 Graduate Studies in Geography 1
   - GEOG 501 Geographic Thought Through Time 2

Total Credits 3

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).

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 GEOG 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 GEOG 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:
   - GEOG 500 Graduate Studies in Geography 1
   - GEOG 501 Geographic Thought Through Time 2
   - GEOG 576 Field Methods and Analysis in Geography 3
   - GEOG 578 Geographic Research and Writing 2

Total Credits 8
Successful completion of the 12-credit GISc Certificate requires the following:

**Certificate Requirements**

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 GEOG 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.

**Required Core Courses**

- GEOG 471 & 471L: Cartography and Visualization and Cartography and Visualization Laboratory (3 credits)
- GEOG 474 & 474L: Introduction to Geographic Information Systems (GIS) and GIS Laboratory (3 credits)

**Elective Courses**

Select one of the following:

- GEOG 377: Quantitative Applications in Geography & 377L: Digital Image Processing (3 credits)
- GEOG 475: Digital Image Processing
- GEOG 476: Selected Topics in Geographic Information Systems
- GEOG 575: Seminar in Remote Sensing
- GEOG 591: Directed Study in Geographical Problems

**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.SS.

**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 377L. Quantitative Applications in Geography. 3 Credits.
Application of statistical and mathematical techniques to research topics in geography. Prerequisite: MATH 103 or consent of instructor. 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 474 and 474L. S.
GEOG 474. 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 476. Selected Topics in Geographic Information Systems. 3 Credits.
An examination of a specific application area or set of techniques in GIS including, but not limited to, Business GIS, Environmental GIS, GIS Databases, GIS Scripting and Web-Based GIS. Repeatable to six credits if different topics are examined. Prerequisites: GEOG 474 and GEOG 474L, or instructor consent. Repeatable to 3 credits. On demand.

Harold Hamm School of Geology and Geological Engineering (Geol and GeoE)

http://www.geology.und.edu/

FACULTY: Forsman, Gerla, Gosnold, Hartman, Ho, LeFever, Mahmood, Matheney, Nording, Perkins, Putkonen and Wang

Degrees Granted:
The Harold Hamm School of Geology and Geological Engineering offers programs of study leading to the following graduate degrees:

- Master of Arts (M.A.) in Geology
- Master of Science (M.S.) in Geology
- Doctor of Philosophy (Ph.D.) 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 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: Graduates 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 requirements 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. 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.

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.
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.

1. For admission to the geology Ph.D. 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. For "approved" status, students must have completed a 5-6 credit hour geology field course, along with satisfactory achievement in supporting science and mathematics, as determined by the department graduate admissions committee.
3. For all graduate programs in the Department of Geology and Geological Engineering, a cumulative 3.0 or higher grade point average is required.
4. Submission of a Graduate Record Examination (GRE) general test score is strongly recommended if you do not have a degree in geology. Applicants are encouraged to submit their GRE score to support their application.
5. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

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.

**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 Geology and Geological Engineering Department.

Students normally take the equivalent of three years of full-time work beyond the master's degree for the doctorate.

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. A qualifying examination may be required before the end of the student’s first year in a doctoral program.
5. Demonstration of:
   a. proficiency in two foreign languages, or
   b. proficiency in one foreign language and two scholarly tools courses, or
   c. proficiency in four scholarly tools courses (scholarly tools courses typically are advanced undergraduate courses in related fields in mathematics, science, or engineering).
6. Completion of a dissertation, which incorporates independent work that is an original contribution to knowledge.

**Master of Science (M.S.) in Geological Engineering**

**Admission Requirements**

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog. Additionally:

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 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.

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 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.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 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 oral exam at least four weeks prior to defense date (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 major revisions there is no need for another defense session and upon revising the dissertation the examining committee can pass the student. For minor revisions the student is asked to fundamentally revise the methodology 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 998. Thesis. 1-9 Credits.

Undergraduate Courses for Graduate Credit

GEOE 323. Engineering Geology. 4 Credits.

Application of geological and environmental principles to geotechnical engineering design, construction, and operation. Prerequisites: One introductory geology course, MATH 165 and upper division standing in geology or engineering. On demand.

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 hydrology applied to natural and constructed wetlands and other water treatments. 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. Short programs using the finite difference method will be written to demonstrate groundwater movement and storage. Simulation of practical groundwater problems will be carried out using the U.S. Geological Survey's MODFLOW code. Prerequisites: GEOL 417 and MATH 265; some programming experience is recommended. F.

GEOE 455. Geomechanics. 3 Credits.
Principles of geomechanics and its application to petroleum and geological engineering. Prerequisites: GEOL 323 or consent of instructor. F.

GEO Courses

GEO 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.

GEO 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.

GEO 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.

GEO 509. Advanced Mineralogy. 1-4 Credits.
Advanced study of specific mineral groups or selected topics in mineralogy. Prerequisite: GEOL 320; recommended prerequisite GEOL 321.

GEO 511. Advanced Structural Geology. 4 Credits.
Reading and research in special topics in structural geology and geotectonics.

GEO 512. Advanced Petrology. 1-4 Credits.
Selected topics in petrology taught using conventional lecture and laboratory/field approach. Prerequisite: GEOL 320.

GEO 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.

GEO 518. Topics in Advanced Stratigraphy. 2-4 Credits.
Selected topics in lithostratigraphy and biostratigraphy. Prerequisites: GEOL 411, GEOL 415. Repeatable to 4 credits.

GEO 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.

GEO 522. History and Philosophy of Geology. 3 Credits.
Historical and philosophical development of the science of geology. Prerequisite: Permission of instructor.

GEO 523. Topics in Advanced Geomorphology. 1-4 Credits.
Selected topics in geomorphic processes and landforms. Prerequisite: GEOL 311. Repeatable to 4 credits.

GEO 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.

GEO 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.

GEO 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.

GEO 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.

GEO 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.

GEO 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.

GEO 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.

GEO 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.

GEO 590. Research. 1-4 Credits.
Laboratory, field, or library research on problems of interest (may be repeated). Repeatable.

GEO 591. Directed Studies. 1-4 Credits.
Directed advanced research in a specialized field of geologic study (may be repeated). Repeatable.

GEO 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEO 997. Independent Study. 2 Credits.

GEO 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

GEO 999. Dissertation. 2-12 Credits.
May be repeated up to 24 credits. Repeatable to 24 credits.

Undergraduate Courses for Graduate Credit

GEO 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: GEO 101 or GEOE 203; MATH 165, PHYS 211, CHEM 121 or consent of instructor. F.

GEO 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.

GEO 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: GEO 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 GEODE 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 GEODE 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 (Geo 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, Iseninger, 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 in the fields of North American, European, and World History. Successful students will be prepared to seek careers as history teachers at the high school and junior college level, as public historians, museum curators, 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 history graduate 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
   - Select one of the following (research seminar):
     - HIST 511 Research Seminar in American History 3
     - HIST 513 Research Seminar in World History

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
   - Select two of the following (research seminar):
     - HIST 511 Research Seminar in American History 6
     - HIST 513 Research Seminar in World History
     - HIST 515 Research Seminar in European History
   - Select two of the following (reading courses):
     - HIST 592 Readings in World History
     - HIST 593 Readings in American History
     - HIST 594 Readings in European History
   - 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. The candidate will successfully complete a scholarly independent investigation of a topic chosen in consultation with the advisor and members of the supervisory committee.

7. The candidate will successfully complete a comprehensive written examination administered by the advisor and supervisory committee, responding to the student’s program of study.
**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 (reading seminar): 3
     - HIST 511 Research Seminar in American History
     - HIST 513 Research Seminar in World History
     - HIST 515 Research Seminar in European History
   - Select two of the following (reading courses): 6
     - HIST 592 Readings in World History
     - HIST 593 Readings in American History
     - HIST 594 Readings in European History

   **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: 3
     - PSYC 501 Psychological Foundations Educ
     - T&L 544 Assessment in Higher Education
     - T&L 545 Adult Learners
     - T&L 547 Technology in Higher Education

   **Total Credits** 6

5. HIST 599 Internship in the Teaching of History (9 credits): A teaching internship of nine credits. Supervision of the internship is the responsibility of the student’s faculty advisor or an alternative named by the Department Graduate Committee. Students in the internship will teach:
   - HIST 101 Western Civilization I 6
   - or HIST 102 and Western Civilization II
   - or HIST 103 United States to 1877
   - or HIST 104 and United States since 1877
   - A course at the 200 or 300 level in their field of concentration

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 adviser 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
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.

**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 up to 6 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 555. Seminar in the Teaching of History. 3 Credits.** Required for 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 558. Directed Readings. 3 Credits.** Independent, directed readings on a topic tailored to the individual needs of the student. Doctoral students may repeat this course to a maximum of 6 credits; Master's students may not repeat the course. Prerequisite: Graduate status.

**HIST 559. 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 563. Readings in American History. 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 Master of Arts program with a U.S. primary concentration will not ordinarily take more than one 563. Repeatable to 30 credits.

**HIST 564. Readings in European History. 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 Master of Arts program with a European primary concentration will not ordinarily take more than one 564. Repeatable to 30 credits.

**HIST 575. 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/U grading.
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 6 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 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 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, Walch, 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:

3.  KIN 404  Adapted Physical Activity  3
   KIN 402  Exercise Physiology  3
   or KIN 332  Biomechanics
   KIN 276  Motor Learning  2-3
   or KIN 355  Applied Motor Development
   KIN 440  Sport Psychology  3
   or KIN 401  Sport Sociology

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:
   3. 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 998  Thesis  4-9

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:
   3. KIN 501  Introduction to Research in Kinesiology  4
   KIN 526  Introduction to Kinesiology Statistics  3

3. KIN 501  Introduction to Research in Kinesiology  4
   KIN 526  Introduction to Kinesiology Statistics  3

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. Select permanent advisor and submit the Program of Study by the completion of nine graduate credits.
7. Complete independent study.
8. Pass a written and oral final comprehensive examination administered by a committee made up of members from the department's graduate faculty.

Courses

KIN 501. Introduction to Research in Kinesiology. 4 Credits.
The study of quantitative and qualitative research methods used in the field of kinesiology.

KIN 502. Evaluation in Kinesiology. 3 Credits.
The course will deal with the determination of standards for human performance in kinesiology, and the principles to apply these standards for exercise prescription.

KIN 511. Theory and Practice in Administration. 2 Credits.
A study of the knowledge, skills and insights as they relate to planning, management and leadership necessary for effective administration of programs. Prerequisite: KIN 341 or consent of instructor.

KIN 512. Theory and Practice in Sports Administration. 2 Credits.
Problems, policies and facilities in athletic departments with emphasis at the secondary level. Public relations problems met and problems of interrelationships with the general curriculum.

KIN 513. Supervision of Teaching and Coaching in Sports and Fitness Education. 3 Credits.
The study of the knowledge and skills necessary to supervise teaching and coaching in sport and fitness education. Prerequisite: KIN 521 or consent of instructor.

KIN 514. Theory and Practice in Intramural Sports Administration. 2 Credits.
Study of the basic ingredients required to administer a successful intramural program.

KIN 520. Curriculum Development for Physical Education. 3 Credits.
A study of processes for planning, implementing, and evaluating curriculum in physical education.

KIN 521. Analysis of Teaching and Coaching. 3 Credits.
A review of the knowledge and skills for instruction of physical activity and sports, with practical applications to teaching and coaching.

KIN 523. Historical and Philosophical Foundations. 2 Credits.
Educational justification of various phases of the kinesiology based on historical and philosophical evidence.

KIN 524. Adapted Activities. 3 Credits.
Theory and practice of modified activities adapted to needs, capacities and abilities of the atypical child. Prerequisite: KIN 404 or consent of instructor.

KIN 525. Motor Development. 3 Credits.
Study of age-related performance changes across the life span. Emphasis will be on physical and mental change as they affect motor skill acquisition and performance. Prerequisite: KIN 276 or KIN 355 or consent of instructor.

KIN 526. Introduction to Kinesiology Statistics. 3 Credits.
Understanding, interpreting, and reporting results of basic statistical analyses (descriptive and inferential, up to and including factorial and repeated measures ANOVAs) used in kinesiology research. Prerequisite: Kinesiology major or consent of instructor.

KIN 529. Exercise Psychology. 3 Credits.
A research-based study of the psychological aspects that are associated with participation in exercise/physical activity. Prerequisite: KIN 440 or consent of instructor.

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 501. 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 502. 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.  
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: Baart, Baker, Bickford (Program Director), Clifton, Fraiser, M.H. Fried, R. Fried, Hansen, Humnick, Karan, Marlett, Roberts, Slater (Graduate Director), Snider, Trammel, Watters, D.A. Weber and D.D. 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 endangered 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.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degrees and Certificates sections. Students are initially accepted into the program only in the summer session when the program’s faculty members are on campus. Students may also take Linguistics courses without applying to a degree or certificate program.

Deadlines: U.S. citizens who wish to take courses listed under Linguistics (whether in a degree/certificate program or not) should fill in SIL’s pre-application form on their website (http://applying.silund.org). This needs to be done before each summer that a student wants to enroll, preferably by April 1. In addition, if people want to enter the M.A. program in a given summer, they must complete all UND application requirements by April 15; to enter the certificate program, the deadline is May 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 if they are not applying to enter the degree or certificate program; if they want to enter the M.A. or certificate program that summer, they should submit the pre-application form by January 15 and complete admissions requirements by February 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) and the director of graduate studies is Keith Slater (keith.slater@gradschool.und.edu). Information is also available from the SIL office on campus when the courses are in session during the summer (701-777-0575).

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/degreerequirements] 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
   - LING 521 Literacy Program Planning and Management
   - LING 522 Materials and Methods in Adult Literacy
   - LING 530 Introduction to Writing Systems
   - 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](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: LING 455 and proficiency in a natural signed language equivalent to at least one year of college-level study. 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 trainers' 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: Bevelacqua, Collings, Dearden, Dunnigan, Halcrow, Hong, J. liams (Graduate Director), M. liams, Khavanin, Metzger, Millsbaugh, Minnotte, 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 Analysis I and MATH 432 Introduction to Analysis II 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: 12
- MATH 512 Modern Analysis I
- or MATH 513 Modern Analysis II
- MATH 515 Applied Mathematics
- or MATH 516 Applied Mathematics
- MATH 518 Algebra I
- or MATH 519 Algebra II
- MATH 520 Topology I
- or MATH 521 Topology II
- MATH 541 Linear Statistical Models
- or MATH 542 Advanced Topics in Statistics and Probability

At least one additional graduate level mathematics course 3
The applicant must meet the School of Graduate Studies’ current minimum Admission Requirements.

### 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.

#### 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.

#### Required Courses:

Select two of the following sequences:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MATH 512</td>
<td>Modern Analysis I</td>
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<tr>
<td>or MATH 513</td>
<td>Modern Analysis II</td>
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<tr>
<td>MATH 515</td>
<td>Applied Mathematics</td>
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<tr>
<td>or MATH 516</td>
<td>Applied Mathematics</td>
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<tr>
<td>MATH 518</td>
<td>Algebra I</td>
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<td>or MATH 519</td>
<td>Algebra II</td>
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<td>MATH 520</td>
<td>Topology I</td>
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<td>or MATH 521</td>
<td>Topology II</td>
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<tr>
<td>MATH 541</td>
<td>Linear Statistical Models</td>
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<tr>
<td>or MATH 542</td>
<td>Advanced Topics in Statistics and Probability</td>
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</tbody>
</table>

At least one additional graduate level mathematics course

| Course Code || |
|-------------|---|
| MATH 998    | Thesis | 4 |
| Electives/Cognates | 11 |

Total Credits: 60

#### 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.
5. A minimum of 6 credits in an area cognate to the area of concentration.
6. A minimum of 6 credits in the Foundations of Education.
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 \( \alpha \) - 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 \( L^p \) and \( l^p \), 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 500. 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: 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 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 578. Probability and Statistics for Middle School Teachers. 3 Credits.
Probability and statistics 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: counting, empirical and theoretical probabilities, simulation of probabilistic events, conditional probability, expected value, data and variables, random sampling, measures of central tendency and spread, least squares regression, 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 579A. Practicum in Middle School Mathematics. 2 Credits.
Teachers will use their content and pedagogical knowledge to plan lesson(s) and develop and implement an action research project in their school. May be repeated for up to 6 credits. May not be used in Ph.D. or Master's programs. Prerequisites: Licensed K-12 teacher, Math 276, 577 or 578 and instructor consent. Repeatable to 6 credits.

MATH 579B. Practicum in Middle School Mathematics. 2 Credits.
Teachers will use their content and pedagogical knowledge to plan lesson(s) and develop and implement an action research project in their school. May be repeated for up to 6 credits. May not be used in Ph.D. or Master's programs. Prerequisites: Licensed K-12 teacher, Math 276, 577 or 578 and instructor consent.

MATH 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

MATH 997. Independent Study. 2 Credits.

MATH 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

Undergraduate Courses for Graduate Credit

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 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 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.

Medical Laboratory Science
http://med.und.edu/mls

FACULTY: Coleman, Paur (Chair, Graduate Program Director), Lunak, Peterson, Porter, Ray, Schill, Solberg, and Triske

Degree Granted: Master of Science (M.S.)
The Department of Medical Laboratory Science offers a graduate program leading to the Master of Science degree in Medical Laboratory Science (CLS), non-thesis option. The course of study enhances the student’s knowledge and skills in many areas of medical laboratory science. The curriculum is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors, laboratory educators, and/or leaders in the profession. The MS in MLS degree at UND is designed to accommodate working laboratory professionals, with online coursework and only two four-day on-campus residency requirements.

The MS in MLS curriculum requires a minimum of 33 graduate-level semester credits, with courses separated into three categories: Foundations Courses, Core Courses, and Elective Course. The 12 required credits of Foundations Courses focus on fundamentals of advanced-level practice in the field of MLS including technical concepts, communication skills, and project development. Core Courses address the scientific content/theory related to the major testing areas in the medical laboratory. At least four Core Courses (12 credits) are required for degree completion, ensuring a rigorous and diverse course schedule that upholds the program’s commitment to a generalist emphasis. Lastly, elective courses related to Specialty areas—education, leadership, management, etc.—are available for students to customize their degree to fit individual needs. Common to all courses will be an emphasis on scholarly investigation, communication, and developing content expertise. The curriculum requires two separate four-day residency requirements as follows:

1. MLS 524 (Current Trends/Issues for the Lab Professional): Mon-Thu first full week in October
2. MLS 515 (Capstone in MLS): Tue-Fri the week of UND spring commencement in May

The courses are offered through online WEB based learning. Students participating in online coursework are required to have Internet access. Specific computer requirements are available from the MLS program. A limited number of teaching and research assistantships are available for students wishing to study on campus.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section and at: med.und.edu/mls.

Master of Science (M.S.)
Mission Statement and Program Goals
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, the prospective students must fulfill the requirements for admission to the graduate program in Medical Laboratory Science.

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 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. Prior experience in a medical laboratory is recommended.
5. Application deadlines: July 15 (Fall semester); October 15 (Spring semester).

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.

**MLS 501** Advanced Laboratory Practice: Technical Concepts 3
**MLS 515** Capstone in Medical Laboratory Science 2
**MLS 524** Current Trends and Issues in Medical Laboratory Science 2
**MLS 997** Independent Study 2
**MLS 525** Professional Communication in the Medical Laboratory 3

**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 505. 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 506. Advanced Clinical Chemistry. 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 507. Advanced Clinical Immunohematology. 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 508. Leadership for the Laboratory Professional. 3 Credits.**
This course will focus on developing leadership skills applicable to the medical laboratory profession. 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. Prerequisite: MLS program students only. F.S.

**MLS 513. 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. Prerequisite: Consent of instructor is required; MLS program students only. F.S.

**MLS 515. 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 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 522. 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 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 524. Current Trends and Issues in Medical Laboratory Science. 2 Credits.
This course is an introductory experience that occurs in a face-to-face environment at the beginning of the degree process. Through group discussion and presentations, Medical Laboratory Science graduate students will explore current trends and issues related to all aspects of the profession. 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/biomedicalsclences/

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.
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 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 two of the following (4 credits):
   MBIO 501 Molecular Virology 2
   MBIO 504 Microbial Physiology 2
   MBIO 508 Microbial Pathogenesis 2
   MBIO 512 Microbial Genetics 2
   MBIO 519 Advanced Immunology 2
   MBIO 591 Special Problems in Microbiology 1-6
8. An overall GPA of at least 3.0.
10. Minimum course requirements as follows:

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<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIMD 500</td>
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<tr>
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<td>BIMD 513</td>
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<td>BIMD 516</td>
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<td>MBIO 511</td>
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<td>MBIO 590</td>
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<td>&amp; MBIO 998 &amp; Thesis</td>
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Select two of the following:

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<tbody>
<tr>
<td>MBIO 501</td>
<td>Molecular Virology</td>
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<tr>
<td>MBIO 504</td>
<td>Microbial Physiology</td>
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<tr>
<td>MBIO 508</td>
<td>Microbial Pathogenesis</td>
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</tbody>
</table>

University of North Dakota
10. Minimum course requirements as follows:

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<tbody>
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<td>Microbial Genetics</td>
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<tr>
<td>MBIO 519</td>
<td>Advanced Immunology</td>
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</tr>
<tr>
<td>MBIO 591</td>
<td>Special Problems in Microbiology</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 25-30

**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. 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 Test.
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 2
   - MBIO 504 Microbial Physiology 2
   - MBIO 508 Microbial Pathogenesis 2
   - MBIO 512 Microbial Genetics 2
   - MBIO 519 Advanced Immunology 2
   - MBIO 591 Special Problems in Microbiology 1-6
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 65
    - MBIO 999 and Dissertation (MBIO 590: up to 59 cr) 8

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

**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 501. Basic Biomedical Statistics. 2 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.

**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 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 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 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, helminths, 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 immune deficiencies and their role 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 540. Research. 1-12 Credits.
The course allows research in pertinent problems in various aspects of biomedical sciences. Repeatable. F,S,SS.

BIMD 541. 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.
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 musical 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.

Music

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.

BIMD 998. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F,S,SS.

BIMD 999. 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 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.

MBIO 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

MBIO 997. Independent Study. 2 Credits.

MBIO 998. Thesis. 1-8 Credits.
Repeatable to 8 credits.

MBIO 999. Dissertation. 1-15 Credits.
Repeatable to 15 credits.

Music

http://arts-sciences.und.edu/music/

FACULTY: Barbu, Blackburn, Blake, Bronfman, Christopherson, Drago, Gable, Ingle, Keyser, Knight, Lewis, Masko, Norman Dearden, Popejoy, Pugh, Rheude, Sugiuara, Towne (Graduate Director) and Wittgraf (Chair)

Music

Mission Statements and Program Goals

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 musical 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 500</td>
<td>Introduction to Graduate Study in Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 502</td>
<td>Perspectives in Music Theory</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 508</td>
<td>Perspectives of Music History</td>
<td>3</td>
</tr>
</tbody>
</table>

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
MUSC 998 Thesis (Music Education Topic) 4
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**  32-43  

**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  
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  3  
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  

**Pedagogy Courses**  
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  

Performance Specialization

Total Credits

Electives

Voice Major

Piano Major

Instrumental Major

Vocal Pedagogy Specialization

Pedagogy Courses

Other Studies

Total Credits

Music Composition Specialization

Pedagogy Courses

Other Studies

Total Credits

Choral Conducting Specialization

Conducting Courses
the Miller Analogies Test.

quantitative, analytical), the Advanced Graduate Record Examination, and/or

Recommended: The Graduate Record General Examination (verbal, general admission requirements as published in the graduate catalog.

The applicant must meet the School of Graduate Studies' current minimum admission requirements as published in the catalog.

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 Depart 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 999 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
An overview of historical and contemporary trends in music education.

**MUSC 507. Foundations of Music Education**
(may serve as Research cognate, 3 options, see below)

**Scholarly Tools in Education**
(may include Minor, 24 credits or Cognate, 12 credits)

**Supporting Area and Electives**
(may include Minor, 24 credits or Cognate, 12 credits)

**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
- **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 510. Chamber Music Literature. 3 Credits.**
An historical overview of piano chamber music literature incorporating reading, listening, score study and analysis.

**MUSC 511. 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. 1-3 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 995. 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.

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Nursing

http://www.nursing.und.edu/


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/.

There are currently six Master of Science tracks, four post-master’s certifications, and two doctorate programs, the Doctor of Philosophy in Nursing and the Doctor of Nursing Practice, that are offered in the graduate nursing program. Thesis or non-thesis independent study options are available at the master’s level and the comprehensive examination and dissertation or DNP Project at the doctoral level. Upon graduation, several nationally based certification examinations are available and are track specific. Students are encouraged to discuss the certification process with their respective track directors.

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 Education Programs.

The Master of Science program currently offers six areas of specialization:

1. Advanced Public Health Nurse
2. Family Nurse Practitioner
3. Adult Gerontological Primary Care Nurse Practitioner
4. Psychiatric Mental Health Nurse Practitioner
5. Nurse Anesthesia
6. 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 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
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:

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>NURS 503</td>
<td>The Business of Practice</td>
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<tr>
<td>NURS 512</td>
<td>DNP Core Concepts I</td>
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<td>NURS 513</td>
<td>DNP Core Concepts II</td>
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<td>NURS 519</td>
<td>Practice Leadership</td>
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<td>NURS 522</td>
<td>Health Informatics</td>
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<td>NURS 582</td>
<td>Health Policy</td>
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<tr>
<td>NURS 593</td>
<td>DNP Internship I</td>
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<td>NURS 594</td>
<td>DNP Internship II</td>
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<td>NURS 596</td>
<td>DNP Capstone</td>
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<td>NURS 598</td>
<td>Evidence Based Research I</td>
<td>3</td>
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<tr>
<td>NURS 599</td>
<td>Evidence-Based Research II</td>
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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 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 cumulative GPA of 3.5 or above in graduate coursework.
4. Graduate Record Examination or Miller’s Analogy Test scores within past five years.
5. Completion of a statistics course.
6. A one-page paper stating the applicant’s research interests and professional goals.
7. Evidence of current, unencumbered licensure to practice as a registered nurse.
8. Three letters of recommendation.
9. Résumé.
10. Satisfy the Graduate School’s English Language Proficiency requirements as published in the graduate catalog.
11. An interview will be required for applicants meeting these basic admission requirements.
12. Submit to and satisfactorily complete a background check prior to admission.
13. Applications are due February 1 of the calendar year.
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:

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<tr>
<td>NURS 573</td>
<td>Research Funding</td>
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<td>NURS 574</td>
<td>Quantitative Nursing Methods</td>
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<td>NURS 575</td>
<td>Qualitative Nursing Research</td>
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<td>NURS 580</td>
<td>Research Practicum</td>
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<tr>
<td>NURS 557</td>
<td>Foundations of Nursing Science</td>
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<td>NURS 565</td>
<td>Rural Populations and Rural Health</td>
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<td>NURS 577</td>
<td>Rural Healthcare Ethics</td>
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<tr>
<td>NURS 586</td>
<td>Rural Health Programs and Research</td>
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<tr>
<td>NURS 579</td>
<td>Dissertation Seminar (three 1-credit hour courses)</td>
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<tr>
<td>NURS 999</td>
<td>Dissertation (15 credit hours total required)</td>
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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.

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 501. Complementary Therapies. 3 Credits.

The focus of this interdisciplinary elective course is the analysis of theory, research, and practice of complementary health therapies. The goal of this course is not to provide skills training in any specific technique. Instead, the course is intended to augment the health care professional’s education by providing a broad overview of selected complementary therapies commonly used in the United States. Legal and ethical implications will be analyzed.

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.

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 healthcare education 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 pathophysiologic, and pharmacological principles. Analysis, integration, and utilization of research to improve clinical 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 519. Practice Leadership. 2 Credits.
This course focuses on practice leadership theories and strategies relative 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 Anesthesia. 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, pharmaceutical, 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 PMHN 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, pharmaceutical, 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 concepts foundational to 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 compounded vulnerability of rurality and disadvantaged groups are analyzed. Prerequisite: A graduate level Epidemiology course or permission of instructor. S.

NURS 554. Advanced PHN I. 4 Credits. NURS 554 introduces concepts foundational to advanced PHN practice and population health. Corequisite: NURS 547.

NURS 557.* 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 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 PMHN 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 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: NURS 574, NURS 575 or consent of the instructor. 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 585 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 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 DNA 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 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 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 upper division 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.

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 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</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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<tr>
<td>NURS 504</td>
<td>Advanced Pharmacology I</td>
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<td>NURS 506</td>
<td>Advanced Pharmacology II</td>
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<td>NURS 507</td>
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<td>Nurse Anesthesia Review Course</td>
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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/Pathophys II</td>
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<td>NURS 517</td>
<td>Anesthesia Seminar and Clinical Practicum II</td>
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<td>NURS 520</td>
<td>Prof Role Devmt/Nurse Anesthesia</td>
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<td>NURS 521</td>
<td>Foundations of Anesthesia Practice</td>
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<td>NURS 527</td>
<td>Anesthesia Seminar and Clinical Practicum III</td>
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<td>NURS 585</td>
<td>Advanced Health Assessment</td>
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<td>NURS 597</td>
<td>Advanced Clinical Practicum</td>
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<td>ANAT 591</td>
<td>Special Topics in Anatomy and Cell Biology</td>
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<td>BIMD 510</td>
<td>Basic Biomedical Statistics</td>
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<tr>
<td>NURS 997</td>
<td>Independent Study</td>
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</table>

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

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 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 May 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.

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:

**Course List**

<table>
<thead>
<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>NURS 509</td>
<td>Foundations for Nurse Education</td>
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<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</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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<td>NURS 585</td>
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<td>or NURS 998</td>
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<tr>
<td>NURS 514</td>
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**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 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 January 15 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 Thesis. The non-thesis option requires completion of two project-related credits. 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:

Family Nurse Practitioner
(mostly on-line courses)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>NURS 500</td>
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<td>NURS 523</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 532</td>
<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>
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<td>or NURS 998</td>
<td>Thesis</td>
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</table>

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.

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 January 15 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. 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:
Psychedelic Mental Health Nursing Nurse Practitioner
(on-line courses)

NURS 500 Theories/Concepts Nursing 3
NURS 502 Evidence for Practice 3
NURS 510 Adv Physiology/Pathophysiology I 3
NURS 511 Adv Physiology/Pathophysiology II 3
NURS 514 Essentials in Epidemiology 3
NURS 523 Health Promotion 3
NURS 526 Ethical, Legal and Health Policy Issues 3
NURS 535 Advanced Pharmacology for Primary Care I 2
NURS 538 Psych Diagnostic Reasoning 2
NURS 539 Advanced Pharmacology for Primary Care II 2
NURS 553 Role Development of the NP 2
NURS 564 Psychopharmacology 2
NURS 583 Individual Therapy 2
NURS 584 Group and Family Therapies 3
NURS 585 Advanced Health Assessment 3
NURS 588 Management of Psychopathology I 2
NURS 589 Management of Psychopathology II 2
NURS 597 Advanced Clinical Practicum 12
NURS 997 Independent Study or NURS 998 Thesis 2-4

Total Credits 57-59

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 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 January 15 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.

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:

NURS 500 Theories/Concepts Nursing 3
NURS 502 Evidence for Practice 3
NURS 510 Adv Physiology/Pathophysiology I 3
NURS 511 Adv Physiology/Pathophysiology II 3
NURS 514 Essentials in Epidemiology 3
NURS 523 Health Promotion 3
NURS 526 Ethical, Legal and Health Policy Issues 3
NURS 531 Adult-Gerontology Illness Management I 3
NURS 533 Adult-Gerontology Illness Management II 3
NURS 535 Advanced Pharmacology for Primary Care I 2
NURS 539 Advanced Pharmacology for Primary Care II 2
NURS 553 Role Development of the NP 2
NURS 585 Advanced Health Assessment 3
NURS 597 Advanced Clinical Practicum 14
NURS 997 Independent Study or NURS 998 Thesis 2-4

Total Credits 52-54

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.
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 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:

Advanced Public Health Nurse
(on-line courses)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 500</td>
<td>Theories/Concepts Nursing</td>
<td>3</td>
</tr>
<tr>
<td>NURS 502</td>
<td>Evidence for Practice</td>
<td>3</td>
</tr>
<tr>
<td>NURS 514</td>
<td>Essentials in Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 523</td>
<td>Health Promotion</td>
<td>3</td>
</tr>
<tr>
<td>NURS 526</td>
<td>Ethical, Legal and Health Policy Issues</td>
<td>3</td>
</tr>
<tr>
<td>NURS 546</td>
<td>Advanced PHN I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 547</td>
<td>Advanced PHN Practicum I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 548</td>
<td>Advanced PHN II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 549</td>
<td>Advanced PHN Practicum II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 550</td>
<td>Global Public Health Issues</td>
<td>2</td>
</tr>
<tr>
<td>NURS 572</td>
<td>Diverse Vulnerable Populations</td>
<td>3</td>
</tr>
<tr>
<td>NURS 592</td>
<td>Advanced PHN Practicum III</td>
<td>4</td>
</tr>
<tr>
<td>NURS 997</td>
<td>Independent Study</td>
<td>2-4</td>
</tr>
<tr>
<td>or NURS 998</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

| Total Credits | 40-42 |

Students complete 11 credits of Advanced PHN Practicum, to comply with certification requirements.

Post-Master’s Certificates in Nursing

Description
Five post-master’s certificate tracks are offered, including the Advanced Public Health Nurse Certificate, the Family Nurse Practitioner Certificate, the Nurse Anesthesia Certificate, Psychiatric Mental Health Nurse Practitioner Certificate, and the Nurse Educator Certificate. The certificate programs are offered to nurses with master’s degrees in nursing who are seeking additional career options.

Certificate in Advanced Public Health Nurse

Admission Requirements
1. Masters degree in nursing.
2. Licensure as a registered nurse.

A total of 32 credits is required for the Advanced Public Health Nurse specialization. The identified courses meet the certification requirements of the American Nurses Credentialing Center. The following courses are required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 502</td>
<td>Evidence for Practice</td>
<td>3</td>
</tr>
<tr>
<td>NURS 514</td>
<td>Essentials in Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 523</td>
<td>Health Promotion</td>
<td>3</td>
</tr>
<tr>
<td>NURS 546</td>
<td>Advanced PHN I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 547</td>
<td>Advanced PHN Practicum I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 548</td>
<td>Advanced PHN II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 549</td>
<td>Advanced PHN Practicum II</td>
<td>3</td>
</tr>
<tr>
<td>NURS 550</td>
<td>Global Public Health Issues</td>
<td>2</td>
</tr>
<tr>
<td>NURS 572</td>
<td>Diverse Vulnerable Populations</td>
<td>3</td>
</tr>
<tr>
<td>NURS 592</td>
<td>Advanced PHN Practicum III</td>
<td>4</td>
</tr>
</tbody>
</table>

| Total Credits | 32 |

Certificate in Family Nurse Practitioner

Admission Requirements
1. Master’s degree in nursing.
2. Licensure as a registered nurse.
Certificate Requirements

A total of 48 credits is required for the Family Nurse Practitioner Certificate. These courses meet the requirements of the American Nurses Credentialing Center. The following courses are required:

- NURS 502  Evidence for Practice  3
- NURS 510  Adv Physiology/Pathophysiology I  3
- NURS 511  Adv Physiology/Pathophys II  3
- NURS 514  Essentials in Epidemiology  3
- NURS 523  Health Promotion  3
- NURS 531  Adult-Gerontology Illness Management I  3
- NURS 532  Family Nursing  3
- NURS 533  Adult-Gerontology Illness Management II  3
- NURS 535  Advanced Pharmacology for Primary Care I  2
- NURS 539  Advanced Pharmacology for Primary Care II  2
- NURS 553  Role Development of the NP  2
- NURS 565  Advanced Health Assessment  3
- NURS 597  Advanced Clinical Practicum (Practicum I, II, and III)  14

Total Credits  47

Certificate in Psychiatric Mental Health Nurse Practitioner

Admission Requirements

1. Master’s degree in nursing.
2. Licensure as a registered nurse.
3. Completion of a successful interview.

Certificate Requirements

A total of 49 credits is required for the Psychiatric and Mental Health Nurse Practitioner Certificate. These courses meet the requirements of the American Nurses Credentialing Center.

- NURS 502  Evidence for Practice  3
- NURS 510  Adv Physiology/Pathophysiology I  3
- NURS 511  Adv Physiology/Pathophys II  3
- NURS 514  Essentials in Epidemiology  3
- NURS 523  Health Promotion  3
- NURS 535  Advanced Pharmacology for Primary Care I  2
- NURS 538  Psych Diagnostic Reasoning  2
- NURS 539  Advanced Pharmacology for Primary Care II  2
- NURS 553  Role Development of the NP  2
- NURS 564  Psychopharmacology  2
- NURS 583  Individual Therapy  2
- NURS 584  Group and Family Therapies  3
- NURS 585  Advanced Health Assessment  3
- NURS 588  Management of Psychopathology I  2
- NURS 589  Management of Psychopathology II  2
- NURS 597  Advanced Clinical Practicum  12

Total Credits  49

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 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**

**Mission Statement**
The development of a scholar requires immersion in research. The goal of nursing research is to inform policy and improve health and the practice of nursing. The focus of the UND research-intensive Nursing PhD Program is Rural Health with research corridors of behavioral and environmental. Actualizing this particular focus entails skills in promoting health behaviors, improving networks of information, systems and policy, attention to the environment, and closing the gap of translational research. Nurse scientists must be proactive in conducting research in a climate of rapidly changing technology. Accountability and integrity are core values of the UND Nursing PhD Program.

**Program Goals**
1. Synthesize in-depth knowledge of behavioral and environmental aspects of rural health.
2. Translate nursing research to inform healthcare practice and policy.
3. Integrate philosophical and theoretical underpinnings of science to guide research.
4. Conduct original research that is ethical and rigorous.
5. Engage in interdisciplinary research teams.
6. Provide professional and research mentorship to others.
7. Contribute to a global community of scholars.

**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 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 cumulative GPA of 3.5 or above in graduate coursework.
4. Graduate Record Examination or Miller's Analogy Test scores within past five years.
5. Completion of a statistics course.
6. A one-page paper stating the applicant's research interests and professional goals.
7. Evidence of current, unencumbered licensure to practice as a registered nurse.
8. Three letters of recommendation.
9. Resumé.
10. Satisfy the Graduate School’s English Language Proficiency requirements as published in the graduate catalog.
11. An interview will be required for applicants meeting these basic admission requirements.
12. Submit to and satisfactorily complete a background check prior to admission.
13. Applications are due February 1 of the calendar year.

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://www.nursing.und.edu/nutrition/index.cfm

Flanagan (Chair), Tande, Walker 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 prepare students for leadership roles that address nutrition problems, develop solutions, and measure impacts.

Our program goals are to training professionals who:

- integrate research, teaching, practice and service to identify nutrition problems, and develop solutions, especially in rural, underserved areas.
- communicate clearly, accurately and in a culturally appropriate manner.
- demonstrate critical-thinking and intellectual awareness in problem-solving and assessment.
- exhibit professionalism, ethical conduct, cultural competency, and leadership skills.

**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 all three specializations:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>N&amp;D 541</td>
<td>Biochemical and Physiological Basis of Nutrition: Macronutrients</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 542</td>
<td>Biochemical and Physiological Basis of Nutrition: Micronutrients</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 550</td>
<td>Nutrition Education and Program Planning</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 591</td>
<td>Seminar in Nutrition (repeatable, 1 credits needed)</td>
<td>1</td>
</tr>
<tr>
<td>N&amp;D 594</td>
<td>Research Methods in Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>N&amp;D 560</td>
<td>Nutrition Counseling</td>
<td>3</td>
</tr>
<tr>
<td>NURS 582</td>
<td>Health Policy</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 596</td>
<td>Nutrition Education and Counseling Practicum</td>
<td>2</td>
</tr>
<tr>
<td>N&amp;D 997</td>
<td>Independent Study</td>
<td>2-4</td>
</tr>
<tr>
<td>or N&amp;D 998</td>
<td>Thesis</td>
<td></td>
</tr>
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</table>

Nutrition Education and Counseling Specialization course requirements:

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>N&amp;D 552</td>
<td>Professional Nutrition Precepting</td>
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</tr>
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</table>

Nutrition Science Specialization course requirements:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>NURS 510</td>
<td>Adv Physiology/Pathophysiology I</td>
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<tr>
<td>NURS 511</td>
<td>Adv Physiology/Pathophys II</td>
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</tr>
<tr>
<td>N&amp;D 554</td>
<td>Nutrigenomics</td>
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<tr>
<td>N&amp;D 997</td>
<td>Independent Study</td>
<td>2-4</td>
</tr>
<tr>
<td>or N&amp;D 998</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

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. 2 Credits.
The course examines arenas of public policy and advocacy especially as they potentially impact US food and nutrition issues. The course discusses the foundations of the process development of public policy and the role the nutrition professional can play in the process. Prerequisite: Admission to the program.

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.
N&D 590. Directed Studies in Nutrition. 1-4 Credits.
Designed to meet the needs of an individual student or a small group of graduate students. Course content will be based on the interests and needs of the student(s) in consultation with the faculty member's area of specialization. Prerequisite: Consent of the instructor. Repeatable to 4 credits.

N&D 591. Seminar in Nutrition. 1 Credit.
Discussion of current research and evidence-based practice in nutrition. Practice of oral presentation of scientific data in a professional setting.

N&D 594. Research Methods in Nutrition. 3 Credits.
The course examines the scientific foundation of nutrition research and critiques nutrition research. Students develop a research proposal. Prerequisites: Graduate statistics and admission into the program.

N&D 596. Nutrition Education and Counseling Practicum. 2 Credits.
A block of supervised practice experiences working with diverse populations in a nutrition clinic focusing on the development of advanced nutrition education counseling skills. Students will develop both group and individualized client-centered counseling approaches. Practicum is taken near completion of graduate coursework. Prerequisites: N&D 560, a minimum of 20 credits in graduate program, and declared specialization of nutrition education and counseling. Repeatable to 4 credits. SS, even years.

N&D 997. Independent Study. 1-2 Credits.
Designed to meet the needs of an individual student or a small group of graduate students. Course content will be based on the interest and needs of the student(s) in consultation with the faculty member's area of specialization. Prerequisite: Consent of Instructor. On demand.

N&D 998. Thesis. 1-4 Credits.
A scholarly research project written under the mentorship of the student's advisor. Credit is given upon successful meeting of thesis requirements for the master's degree. Prerequisite: Consent of the instructor.

Occupational Therapy

http://www.med.und.nodak.edu/depts/ot/index.html

FACULTY: Garrison, Hanson, Fox (Graduate Program Director), Grabanski, Graves, Harris, Haskins, Janssen, Jedlicka (Chair), Lamborn, Meyer, Morrison (Professional Program Coordinator at Casper), Nielsen, Stube and Zimmerman

Degree Granted: Master of Occupational Therapy (M.O.T.)
The Occupational Therapy Department offers a five-year entry level Master of Occupational Therapy (MOT) Degree. Occupational Therapy as a profession is based on the belief that occupation, including its interpersonal and environmental components, may be used to prevent and mediate dysfunction and elicit maximum adaptation. UND has two campuses offering the Master's of Occupational Therapy degree. The main campus is located in Grand Forks, ND and the Satellite is located in Casper, WY. For information regarding the program, the website is: http://www.ot.und.edu

The Occupational Therapy Program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE). For information regarding accreditation, contact ACOTE at (301) 652-2682, or ACOTE, c/o Accreditation Department, 4720 Montgomery Lane, Suite 200, Bethesda, MD, 20814-3449. The website 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, 12 South Summit Avenue, Suite 100, Gaithersburg, MD 20877; 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.

Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Master of Occupational Therapy (M.O.T.)

Mission Statement
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 of all people with whom we engage.

Program Goals

Goal 1: Students will be able to analyze and apply the 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:
Admission to the School of Graduate Studies requires:

Year III Professional Program (Psychosocial, Physical Dysfunction, Pediatric) therapy supervisor and should be distributed over the three required areas.

A prerequisite for admission to the UND Professional Program at the Year I level will be 60 hours of observation 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

**Professional Year 1**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 422</td>
<td>Anatomy Occupational Therapy</td>
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<tr>
<td>OT 426</td>
<td>Personal/Professional Development</td>
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**Fall**

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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 423</td>
<td>Fundamentals of Neuroscience for Occupational Therapy</td>
</tr>
<tr>
<td>OT 425</td>
<td>Occupational Therapy with Infants and Pre-School Children</td>
</tr>
<tr>
<td>OT 427</td>
<td>Orientation to Occupational Therapy Theory</td>
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<tr>
<td>OT 428</td>
<td>Quantitative Research Methods-O T</td>
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Fall and Spring Semester Electives

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<tr>
<td>OT 490</td>
<td>4</td>
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<tr>
<td>OT 496</td>
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<tr>
<td>OT 497</td>
<td>4</td>
</tr>
<tr>
<td>OT 593</td>
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| Credits | 40-63 |

Professional Year 3

Summer

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<td>OT 587</td>
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<tr>
<td>OT 995</td>
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<tr>
<td>OT 997</td>
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| Credits | 30-47 |

Fall Electives:

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<tbody>
<tr>
<td>OT 493</td>
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<tr>
<td>OT 508</td>
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</tr>
<tr>
<td>OT 582</td>
<td>1-3</td>
</tr>
<tr>
<td>OT 593</td>
<td>1-3</td>
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<tr>
<td>OT 599</td>
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| Credits | 15-58 |

Spring Electives:

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<tr>
<td>OT 593</td>
<td>1-3</td>
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<tr>
<td>OT 599</td>
<td>1-2</td>
</tr>
</tbody>
</table>

| Credits | 31-35 |

Total Credits | 185-256

Studies

* Department reserves the right to cancel a track and/or elective courses due to finances, staffing issues, or low enrollment. Electives are scheduled based on student interest and faculty resources. Class size may be limited.

OT 200. Introduction to Occupational Therapy. 2 Credits.
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. SS.

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, neurophysiology, and neurobiology. Laboratory included. Prerequisite: Occupational Therapy majors only. F.

OT 424. Muscle Function in Health and Disease. 4 Credits.
The study of muscle action 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. F.

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. SS.

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. F.

OT 428. Quantitative Research Methods—Occupational Therapy. 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 comprehensive rehabilitation. Included are chronic illness, neurological and orthopedic conditions, general medicine and surgery, and sensory disabilities across the lifespan. Prerequisite: Occupational Therapy majors only. S.

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.

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.

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.

OT 456. 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.

OT 458. 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 function/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.

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.

OT 455. Developmental Aspects of Occupational Therapy. 2 Credits.
Cooperative study to facilitate a direct study of the human form through dissection of human cadavers. Prerequisite: Occupational Therapy majors only. SS.
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 482. 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 students 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. On demand.

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. F,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 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. Repeatable to 6 credits. 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:
http://und-public.courseleaf.com/graduateacademicinformation/departmentalcoursesprograms/biomedicals/emolesciences/

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. 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.

**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.

**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.
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>
<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>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>PPT 591</td>
<td>Research in PPT and Dissertation</td>
</tr>
<tr>
<td>PPT 999</td>
<td></td>
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</table>

Total Credits: 89

ELECTIVES

<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 530</td>
<td>Advanced Neurochemistry</td>
<td>3</td>
</tr>
<tr>
<td>PPT 535</td>
<td>Mechanisms of Neurodegenerate 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., 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 Departmental Faculty.

BIMD Courses

**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 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 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 biochemical 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. F.

**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 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 998. Thesis. 1-6 Credits.
Completion of thesis required for M.S. Repeatable to 6 credits. F,S,SS.

BIMD 999. Dissertation. 1-12 Credits.
Completion of dissertation required for Ph.D. Repeatable to 12 credits. F,S,SS.

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.
Physical Education

(See Kinesiology and Public Health Education (p. 515))

Physical Therapy

http://www.med.und.edu/physical-therapy/

FACULTY: Danks, Decker, Elbert, Florn-Meland, Jeno, 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. Our website address is: http://www.med.und.edu/physical-therapy/

Physical therapists provide services to patients who have impairments, functional limitations, and disabilities. 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 train physical therapists who will 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, teaching, service, and research responsibilities 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 is an advocate for service to the community and the profession.

**Goal 3:** The student will develop critical inquiry skills related to clinical and basic science research.

**Goal 4:** The student will develop the skills required for life-long learning.

**Goal 5:** The student is to be an advocate for health and wellness at the individual and societal levels, demonstrate respect for self and others, and a commitment to the profession of physical therapy.

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 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 programs, 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

- ENGL 110 College Composition I: Writing for Public Audiences 3
- ENGL 130 Composition II: Writing for Public Audiences 3
- COMM 110 Fundamentals of Public Speaking 3
- Fine Arts and Humanities 9
- BIOL 150 General Biology I 4
- & 151L and General Biology II Laboratory 4
- CHEM 121 General Chemistry I 4
- & 121L and General Chemistry Laboratory 4
- CHEM 122 General Chemistry II 4
- & 122L and General Chemistry Laboratory 4
- Social Science 3
- PSYC 111 Introduction to Psychology 3
- PHYS 161 Introductory College Physics I & PHYS 162 and Introductory College Physics II 8
- ANAT 204 Anatomy for Paramedical Personnel 3
- PPT 301 Human Physiology 4
- PSYC 250 Developmental Psychology 4
- PSYC 270 Abnormal Psychology 3
- Statistics 3
- Cognate/Minor (required)

Electives (required, minimum of 20 with emphasis in a single discipline)

* Courses should contribute to completion of Essential Studies requirements.

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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</thead>
<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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Credits: 17-18

Spring

<table>
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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>
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<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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Credits: 19-20

Summer

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<tr>
<td>PT 410</td>
<td>Clinical Pathology II</td>
<td>3</td>
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<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>
<td>PT 512</td>
<td>Therapeutic Agents</td>
<td>3</td>
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<tr>
<td>PT 514</td>
<td>Case Management I</td>
<td>2</td>
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<tr>
<td>PT 519</td>
<td>Electrotherapy and Electrodiagnosis</td>
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Credits: 10-11

Professional Year 2

Fall

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<th>Course Title</th>
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<tbody>
<tr>
<td>PT 521</td>
<td>Critical Inquiry I</td>
<td>1</td>
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<tr>
<td>PT 528</td>
<td>Clinical Education I</td>
<td>9</td>
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<tr>
<td>PT 529</td>
<td>Clinical Education II</td>
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Credits: 19

Spring

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PT 522</td>
<td>Administration in Physical Therapy</td>
<td>3</td>
</tr>
<tr>
<td>PT 523</td>
<td>Lifespan I</td>
<td>3</td>
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Courses

PT 510. Integrated Clinical Experience, 1 Credit.
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, outpatient 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, plans of care, and intervention strategies. Evidence based clinical decision making and verbal and written communications related to case management will be emphasized. Prerequisite: Registered in Professional Physical Therapy Curriculum. SS.

PT 519. Electrotherapy and Electrodiagnosis, 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. S.

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. Manual Therapy II, 2 Credits.
Theory and application of manual therapy skills for examination and intervention techniques, including thrust and non-thrust mobilizations/manipulations of the spine, pelvis, and associated areas. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum. F.

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. S.

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 530. Professional Year III, 12 Credits.
Electives

Total Credits Minimum of 125 credits required
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. F.

PT 540. Cardiopulmonary Physical Therapy. 2 Credits.
This course is designed to expand the theoretical understanding and clinical application of cardiopulmonary physical therapy examination, evaluation, diagnosis, prognosis, intervention and outcomes. Laboratory. Prerequisite: Registered in Professional Physical Therapy Curriculum.

PT 541. Clinical Examination and Evaluation Ill. 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 interventions. Emphasis is also given to the communication of findings. Laboratory. F.

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.

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 Ill. 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.
Supervised experience in University teaching in Physical Therapy. Projects in curriculum development, formulation of teaching/learning objectives, teaching materials, evaluation tools, and experience in competency-based learning environment. Prerequisite: Registered in Professional Physical Therapy Curriculum. Repeatable to 4 credits.

PT 583. Critical Inquiry Ill. 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. S.

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 595. 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.nodak.edu/physicianassistant/

FACULTY: Johnson (Medical Director), Kauffman, McCleary, McHugo (Department Chair), Metzger, Sieg, Solberg and Wold

Degree Granted: Master of Physician Assistant Studies (M.P.A.S.)

The Department of Physician Assistant Studies offers a master's degree of Physician Assistant Studies. 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 Master 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.

Track 1

Licensed/Certified Health Care Professional with minimum of 3 years experience

Track 2

Science-based and minimum of 500 (1000 preferred) hours of direct patient care

Academic Requirements

Baccalaureate degree (equivalent to 125 semester credits) from a regionally accredited institution in the United States and preferably in a health related area. The institution must be accredited by one of the following six regional accrediting associations: MSA; NASC; NCA; NEASC-CIHE; SACS-CC; or WASC-Sr. Applicants with a three-year bachelor’s degree must complete the equivalent of one year of post-baccalaureate work. GPA of 3.0 or higher (on a 4.0 scale) 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

- 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 (Track 2 Only)
- Organic Chemistry/Biochemistry* (Track 2 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

Note: The University of North Dakota Physician Assistant Program does not accept transfer students from other PA programs. Advanced standing and transfer of credits is not allowed. CLEP (College Level Examination Programs) or “test out” courses are not accepted.

Additional coursework beyond the minimum academic preparation requirements will strengthen an application, especially if the additional courses are highly correlated with medicine.

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.

Track 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 this track 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 to this track, although these disciplines are certainly valuable to the practice of medicine. Examples of disciplines ineligible for this track include:

- Administrative assistant, hospital/clinic receptionist, phlebotomist, hospital chaplain, personal trainer, medical assistant, social work, CNA, EMT, LPN, dental hygienist and massage therapist.
Track 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 include, but are not limited to:
- Certified medical assistant, certified nursing assistant, dental hygienist, 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. Clinical health care experiences which are not acceptable include, but are not limited to:
- 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.

Track 1:

Track 1 candidates will apply as a team with a licensed physician (MD or DO) and/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.

Track 2:

Track 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 throughout this track is expected as clinical sites may require relocation and adaptability.

Additional Requirements

1. Written personal statement addressing the applicant’s aptitude, ability, dedication and commitment to meeting the program’s mission to “prepare selected health care professionals to become competent physician assistants working collaboratively with physician supervision, emphasizing primary care in rural and/or underserved areas.”

2. Three strong professional letters of reference from health care professionals such as physicians, physician assistants, and/or other clinical supervisors. Applicant may not use relatives or their proposed preceptor as references.

3. If applying under Track 1 admission criteria, an arrangement with a licensed physician (MD or DO) and/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. More information regarding preceptor requirement noted below.

4. All applicants must submit current identification with photo and printed name and proof of certification/license in one’s chosen field (if applicable).

5. Completion of a successful interview.

6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

7. 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.

8. 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. Information can be found on their website: Forms | Student Health | Health & Wellness | The University of North Dakota Information regarding the criminal background check requirements can be found on a link on the PA Program website: Physician Assistant Program | UND School of Medicine & Health Sciences 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.

9. Additional personal and non-cognitive criteria include:
- willingness to assume responsibility for own education
- willingness to accomplish a successful role transition from health care employee to physician assistant student
- evidence of professional role development in clinical decision making, communication and leadership
- sensitivity, enthusiasm, confidence, motivation and sincerity/honesty
- diversity of life experience
- success in overcoming adversity
- aptitude for continued learning

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.

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:

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<td>Professional Issues &amp; Role Development I</td>
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<tr>
<td>PA 581</td>
<td>Emergency Department Clerkship</td>
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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, immunology, genetic and molecular testing and microbiology. Emphasis will include systems such as cardiology, respiratory, endocrinology, gastroenterology and musculoskeletal 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. Emphasis will include systems such as cardiology, reproduction, and renal consistent with concurrent primary care course content. 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. Prerequisites: Admission to Master of Physician Assistant Studies Program. S.

PA 541. Primary Care I Clinical. 6 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 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 evaluated with a preceptor in the clinical setting. Prerequisites: Admission to Master of Physician Assistant Studies Program. S.

PA 551. Primary Care II - Clinical. 9 Credits.
This supervised clinical practical 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 cardiology, respiratory, endocrinology and musculoskeletal are included. Pharmacology and pharmaco therapeutics 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 555. Primary Care III - Clinical. 9 Credits.
This supervised clinical practical 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 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. Tills 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 567. 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 practice 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 580 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 supervised clinical practice 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 supervised clinical practice 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-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, malnutrition, 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 599. Special Topics in Physician Assistant Studies. 1-2 Credits.
Course content elective - A series of clinically relevant lectures, discussions,
and/or supervised practice clinical experiences developed around the practice
of a Physician Assistant. 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 990. 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
526. 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
certified 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, electromagneticism, 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 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. 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.

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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<thead>
<tr>
<th>Course</th>
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<tr>
<td>PHYS 509</td>
<td>Methods of Theoretical Physics</td>
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<td>PHYS 542</td>
<td>Theory of Electricity and Magnetism</td>
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<td>PHYS 543</td>
<td>Statistical Physics</td>
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<td>PHYS 545</td>
<td>Analytical Mechanics</td>
<td>3</td>
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<tr>
<td>PHYS 549</td>
<td>Seminar</td>
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</table>

   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.
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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>
<td>3</td>
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<tr>
<td>PHYS 251CL</td>
<td>University Physics I Lab</td>
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<tr>
<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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<tr>
<td>PHYS 253C</td>
<td>University Physics III</td>
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<td>PHYS 253CL</td>
<td>University Physics III Lab</td>
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<tr>
<td>PHYS 317</td>
<td>Mechanics I</td>
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<tr>
<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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<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>
<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>
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<tr>
<td>PHYS 428</td>
<td>Advanced Physics Laboratory</td>
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<td>PHYS 431</td>
<td>Quantum Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 432</td>
<td>Quantum Mechanics II</td>
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<td>Analytical Mechanics</td>
<td>3</td>
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<tr>
<td>PHYS 590</td>
<td>Research</td>
<td>1-16</td>
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<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>
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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>
<td>3</td>
</tr>
<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>
<td>CHEM 122</td>
<td>General Chemistry II</td>
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<tr>
<td>CHEM 122L</td>
<td>General Chemistry II Laboratory</td>
<td>1</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 548. Seminar. 1 Credit.**

Repeatable to 3 credits.

**PHYS 550. Special Topics. 1-3 Credits.**

Investigation of special topics in advanced physics; the subject matter determined by student faculty interest. Prerequisite: Consent of department. Repeatable to 6 credits.

**PHYS 590. Research. 1-16 Credits.**

Repeatable.

**PHYS 996. Continuing Enrollment. 1-12 Credits.**

Repeatable. S/U grading.
PHYS 997. Independent Study. 2 Credits.
PHYS 998. Thesis. 1-9 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, odd 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, even 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 460. Introduction to Astrophysics. 3 Credits.
Nature of stars. Topics include celestial mechanics, relativity, optics, stellar birth, stellar interiors and evolution, nucleosynthesis, stellar death, compact objects, black holes, neutron stars, white dwarfs, binaries and variable stars. Some topics include the use of computer tools to solve problems. 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. F, odd years.

PHYS 492. Special Problems. 1-3 Credits.
Prerequisite: Approval of the department. Repeatable to 3 credits. F.S.

Psychology

http://www.und.edu/dept/psych/

Bradley, Clinton, Derenne, De Young, Ferraro, Holm (Chair), Kehn, Kelly, King, Legerski, Looby, 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 (Director, Psychological Services Center), De Young, Holm (Department Chair), King, Legerski, Looby, McDonald (INPSYDE Director), Miller (Director of Clinical Training) and Wise

Associated Program Faculty: Derenne, Ferraro, Kehn, Peters, Petros, Plumm, 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 foundational 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: Clinton, 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 3.20 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. 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
   - PSYC 542 Multivariate Statistics for Psychology
   - PSYC 543 Experimental Design
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
   - PSYC 574 Advanced Therapeutic Interventions 3
   - PSYC 575 Behavior Pathology 3
   - PSYC 579 Professional Issues and Ethics in Psychology 3
   - PSYC 594 Special Topics in Psychology 2
   Foundation coursework in
   History of Psychology
   - PSYC 505 History of Psychology 3
   Social Bases of Behavior
   - PSYC 560 Advanced Social Psychology 3
   Biological Bases of Behavior
   - PSYC 535 Physiological Psychology 3
   - PSYC 537 Physiology of Behavior and Psychophysiological Measurement 3
   Cognitive/affective bases of behavior
   - PSYC 533 Theories of Learning 3
   - PSYC 539 Cognitive Psychology 3
   Developmental Basis of Behavior
   - PSYC 576 Child Psychopathology and Treatment 3
   - PSYC 551 Advanced Developmental Psych 3
   Diversity Elective
   - PSYC 521 Diversity Psychology 3
   Research Credits
   - Master's Thesis 6
   - Dissertation 13
   Total Credits 83

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**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 vita summarizing relevant experiences including but not limited to academic coursework, work, volunteer, and research activities.
6. Three letters of recommendation from those who can comment on the applicant's academic abilities and 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 Graduate Studies as well as particular requirements set forth by the Forensic Psychology program.

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):**

- PSYC 520 Foundations of Forensic Psychology 3
- PSYC 521 Diversity Psychology 3
- PSYC 523 Forensic Assessment 3
- PSYC 524 Psychology and Law 3
- PSYC 541 Advanced Univariate Statistics 3
- PSYC 542 Multivariate Statistics for Psychology 3
- PSYC 543 Experimental Design 3
- PSYC 575 Behavior Pathology 3
- PSYC 593 Readings in Psychology 1-3
- PSYC 998 Thesis 1-9

**Elective Courses (12 credits):**

Choose four of the following: 12

- PSYC 501 Psychological Foundations Education
- 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
Required Core Courses (26 credits):

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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>PSYC 594</td>
<td>Special Topics in Psychology</td>
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<tr>
<td>PSYC 594</td>
<td>Special Topics in Psychology</td>
</tr>
<tr>
<td>CJ 515</td>
<td>Human Nature and Crime</td>
</tr>
<tr>
<td>CJ 535</td>
<td>Seminar in Juvenile Justice</td>
</tr>
<tr>
<td>CJ 565</td>
<td>Viclimology</td>
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Total Credits 38-48

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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<tr>
<td>PSYC 520</td>
<td>Foundations of Forensic Psychology</td>
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<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 560</td>
<td>Advanced Social Psychology</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>3</td>
</tr>
<tr>
<td>PSYC 997</td>
<td>Independent Study (research or practicum experience possible)</td>
<td>3</td>
</tr>
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**Elective Courses (9 credits):**

Choose 3 of the following:

<table>
<thead>
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<th>Title</th>
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<tbody>
<tr>
<td>PSYC 501</td>
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<tr>
<td>PSYC 526</td>
<td>Psychological Profiling and Criminal Behavior</td>
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<tr>
<td>PSYC 539</td>
<td>Cognitive Psychology</td>
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<td>PSYC 576</td>
<td>Child Psychopathology and Treatment</td>
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<td>PSYC 587</td>
<td>Supervised Field Work</td>
</tr>
<tr>
<td>PSYC 594</td>
<td>Special Topics in Psychology</td>
</tr>
<tr>
<td>PSYC 594</td>
<td>Special Topics in Psychology</td>
</tr>
</tbody>
</table>

Total Credits 35

**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 background may, after review by the Committee, be permitted to substitute an appropriate forensic psychology graduate elective 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.

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

5. Graduate students in the general-experimental 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, 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 General/Experimental psychology doctoral program.

6. Completion of the comprehensive examination for the Ph.D. in Experimental Psychology.

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.

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: PSYC 111 Introduction to Psychology, PSYC 250 Developmental Psychology, PSYC 270 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. S.

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 526. Psychological Profiling and Criminal 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.

PSYC 539. 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.

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: PSYC 270 or consent of instructor.

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. Prerequisite: Graduate standing in Psychology is the prerequisite.

PSYC 580. Clinical Practice. 1-3 Credits.
Supervised individual practice in techniques of individual psychotherapy, marital therapy, counseling, and guidance of parents and children, 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: Consent of Instructor. Repeatable.

PSYC 595. Seminar in Psychology. 1-3 Credits.
Prerequisites: Consent of instructor.

PSYC 596. Individual Research. 1-6 Credits.
Repeatable.

PSYC 597. 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 599. Dissertation. 1-18 Credits.
Repeatable to 18 credits.

Public Administration

http://business.und.edu/departments/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 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.

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.

Required Courses:

<table>
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<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<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>
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<tr>
<td>POLS 532</td>
<td>Public Policy</td>
<td>3</td>
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<td>POLS 599</td>
<td>Master of Public Administration Capstone</td>
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<tr>
<td>POLS 997</td>
<td>Independent Study</td>
<td>3</td>
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<tr>
<td></td>
<td>General, Health Administration or Social Entrepreneurship Track</td>
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<td>POLS Electives or cognate/elective courses</td>
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</tr>
</tbody>
</table>

Total Credits 34

* Students with a minimum of one year relevant administrative experience may petition the Graduate Program Director to have requirement waived and to substitute a 3-credit elective in its place.
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

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

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

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 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.

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>Year Two</th>
<th>Year Three</th>
<th>Year Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law School</td>
<td>Law School w/two MPA courses</td>
<td>Law School w/two MPA courses</td>
<td>Six MPA courses + Independent Study</td>
</tr>
<tr>
<td>Year One</td>
<td>Seven MPA courses</td>
<td>Year Two</td>
<td>Law School</td>
</tr>
<tr>
<td>Year Three</td>
<td>Law School w/two MPA courses</td>
<td>Year Three</td>
<td>Law School w/two MPA courses</td>
</tr>
<tr>
<td>Year Four</td>
<td>Law School w/one MPA course + Independent Study</td>
<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.

Six credits (approved by the Law School) from the MPA Program will count toward the Law Degree. Six of the 36 required credits in the MPA program can be law courses used as a cognate for the MPA degree (with the approval of the department and the Dean of the School of Graduate Studies).
The total credits required for each degree will be unchanged, because each program will accept six credits toward the other degree. This will save the student one semester (12 credits) and make the program more appealing.

Normally, the joint program will be completed in four years. With summer school classes it may be possible to obtain both degrees even more quickly. 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>Law</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LAW 150</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 201</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 203</td>
<td>2-3</td>
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<tr>
<td>LAW 206</td>
<td>2-4</td>
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<tr>
<td>LAW 210</td>
<td>3-5</td>
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<tr>
<td>LAW 238</td>
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<tr>
<td>LAW 263</td>
<td>3</td>
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<tr>
<td>LAW 277</td>
<td>2-3</td>
</tr>
<tr>
<td>LAW 281</td>
<td>3</td>
</tr>
<tr>
<td>LAW 289</td>
<td>3</td>
</tr>
<tr>
<td>LAW 291 (Poverty Law)</td>
<td>1-4</td>
</tr>
<tr>
<td>LAW 291 (Civil Rights)</td>
<td>1-4</td>
</tr>
<tr>
<td>LAW 291 (State Constitutional Law)</td>
<td>1-4</td>
</tr>
<tr>
<td>Or other courses with the approval of the MPA Director and Graduate Dean</td>
<td></td>
</tr>
</tbody>
</table>

**Political Science and Public Administration**

- POLS 502 Seminar-Problems in State and Local Governments: 3
- POLS 508 Seminar-Legislative and Executive Processes: 3
- POLS 531 Foundations of Public Administration: 3
- POLS 532 Public Policy: 3
- POLS 535 Public Organizations: 3
- POLS 536 Public Personnel Administration: 3
- POLS 538 Public Budgeting and Financial Administration: 3
- POLS 539 Administrative Law: 3

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. 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 (Political Science, 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 take 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.

Students admitted to the certificate program are required to complete four of the three-credit courses (12 credits total) listed below, and are required to maintain a 3.0 GPA 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.

**Courses:**

- POLS 552 Health Policy: 3
- POLS 551 Health Administration and Organization: 3
- LAW 303 "
- ECON 575 Advanced Special Topics: 3
- MPH 504 Leading and Managing Public Health Systems **: 3

* 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 Public Health Systems

**Certificate in Public Administration**

This program seeks to provide the management core needed by professionals from many academic backgrounds who have risen to positions of authority in the public and not-for-profit sector without benefit of formal management training.
Certificate in Policy Analysis

This program seeks to provide the analytic skills needed by professionals from many academic backgrounds who are required to do or understand policy analysis and program planning in the public and not-for-profit sectors. Even managers who do not do research themselves must understand the work of others if they are to make informed decisions based on the information provided in research reports.

Students admitted to the certificate program are required to complete four of the three-credit courses (12 credits total) listed below, and are required to maintain a 3.0 GPA 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: 12

- POLS 531 Foundations of Public Administration
- POLS 533 Administrative Ethics in the Public Sector
- POLS 535 Public Organizations
- POLS 536 Public Personnel Administration
- POLS 538 Public Budgeting and Financial Administration
- POLS 539 Administrative Law

Certificate 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 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/projects from each of the program's four courses listed below.

Select four of the following: 12

- SOC 569 Introduction to Social Entrepreneurship 3
- POLS 561 Creation and Management of Social Enterprises 3
- POLS 562 Political Advocacy and Social Entrepreneurship 3
- ENTR 580 Seminar in Social Entrepreneurship 3

Courses

- POLS 500. Research Methods. 3 Credits.
  A statistics course or consent of instructor. This course will first 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.

- POLS 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 in which 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.

- POLS 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.

- POLS 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.

- POLS 532. Public Policy. 3 Credits.
  A discussion of the initiation, formulation, adoption, implementation, and evaluation of American public policy. Various policy areas such as agriculture, education, environment, and welfare will be analyzed.

- POLS 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.

- POLS 535. Public Organizations. 3 Credits.
  Description and analysis of bureaucratic organizations with particular emphasis on concepts and characteristics common to public bureaucracies.
POLS 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.

POLS 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.

POLS 538. Public Budgeting and Financial Administration. 3 Credits.
This course will encompass the normative and descriptive budgetary questions in public administration. Orthodox, prevailing, and alternative budget theories are presented in generalized and applied settings.

POLS 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.

POLS 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.

POLS 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.

POLS 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.

POLS 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.

POLS 580. Administrative Internship. 1-3 Credits.
Prior approval of instructor required before enrollment. Students are employed on full-time or part-time basis on onthe-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.

POLS 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.

POLS 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.

POLS 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.

POLS 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.

POLS 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

POLS 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.

POLS 998. Thesis. 1-4 Credits.

Undergraduate Courses for Graduate Credit

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.

Public Health

http://www.med.und.edu/master-of-public-health/

FACULTY: R. Goldsteen (Director), K. Goldsteen, Hand, Hosford, Hultquist, 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.

The MPH Program goals are:

- Education: to provide individuals with the skills, knowledge and awareness necessary to support and ensure conditions that promote population health improvement in North Dakota, the Northern Plains and beyond.
- Research: to conduct and disseminate research that supports health improvement of populations and communities.
- Service: to provide public health related service to academic, professional and community organizations.
- Infrastructure Investment: to advocate for, build and maintain the resources necessary to support the mission of the program.
- Workforce Investment: to recruit, support and retain diverse faculty, staff and students who sustain the program’s mission and values.

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 specializations 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):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPH 531</td>
<td>Biostatistics 1</td>
<td>3</td>
</tr>
<tr>
<td>MPH 551</td>
<td>Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>MPH 552</td>
<td>Environmental Health</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 510</td>
<td>Health Care Systems</td>
<td>3</td>
</tr>
<tr>
<td>MPH 504</td>
<td>Leading and Managing Public Health Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

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.

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>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 551</td>
<td>Health Administration and Organization</td>
<td>3</td>
</tr>
<tr>
<td>POLS 552</td>
<td>Health Policy</td>
<td>3</td>
</tr>
<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>
</tr>
</tbody>
</table>

ELECTIVE COURSES = 6 credits (selected with advisor approval; other courses may be substituted with advisor approval)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<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>
<td>3</td>
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<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>
</tbody>
</table>
GEOG 474 Introduction to Geographic Information Systems (GIS) 2
GEOG 474L GIS Laboratory (Co-requisite with GEOG 474) 1

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

MPH 532 Biostatistics 2 3
MPH 533 Advanced Biostatistics 3
MPH 550 Population Health Research Methods 3
MPH 556 System Dynamics 1 3

ELECTIVE COURSES = 6 credits (selected with advisor approval; other courses may be substituted with advisor approval)

MPH 534 Bioinformatics 3
MPH 535 Health Care Data Mining 3
MPH 538 Introduction to Structural Equation Analysis 3
MPH 558 System Dynamics 2 3
MPH 570 Special Topics in Population Health 1-3
MPH 574 Foundations of Health Economics 3
GEOG 474 Introduction to Geographic Information Systems (GIS) 2
GEOG 474L GIS Laboratory (Co-requisite with GEOG 474) 1

Graduate Certificate in Public Health

Students may earn a graduate certificate in Public Health. The public health certificate is offered as part of the MPH Program. It is designed for individuals who wish to obtain formal training in public health, but do not want to earn the MPH degree. These individuals include those currently working in the public health and health care fields, as well as others. The certificate requires completion of 15 credits. Applicants must meet all admissions requirements of the MPH Program with the exception of completion of a standardized test. All credits from the certificate program are transferrable to 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).

Graduate Certificate in Public Health

MPH 510 Health Care Systems 3
MPH 520 Environmental Health 3
MPH 531 Biostatistics 1 3
MPH 541 Social and Behavioral Sciences in Public Health 3
MPH 551 Epidemiology 3

Courses

MPH 504. Leading and Managing Public Health Systems. 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. F,S,SS.

MPH 510. Health Care Systems. 3 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. F,S,SS.

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. F,S,SS.

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. F,S,SS.

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. F,S,SS.
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 interventional 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. F,S,SS.

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 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. 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 595. 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 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.

Social Work
http://www.und.edu/dept/socialwo/

FACULTY: Barkdull (Chair), Chu, Flanagan, Hseih, Jayasundara, Johnson, Kitko, Nedegaard (MSW Program Director), Quest, Quinn, Reeves, Sage, Schnewels (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.
The Master of Social Work program at the University of North Dakota is accredited by the Council on Social Work Education. All MSW students must complete both 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 Concentration Program. Advanced Generalist Concentration courses may be completed through the Campus Program, or 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 Concentration courses (24 credit hours).

<table>
<thead>
<tr>
<th>Foundation Courses</th>
<th>Total Credits</th>
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<tbody>
<tr>
<td>SWK 501</td>
<td>Human Behavior in the Social Environment I 2</td>
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<tr>
<td>SWK 502</td>
<td>Human Behavior in the Social Environment II 2</td>
</tr>
<tr>
<td>SWK 503</td>
<td>Generalist Practice with Individuals and Families 2</td>
</tr>
<tr>
<td>SWK 504</td>
<td>Generalist Practice with Treatment and Task Groups 2</td>
</tr>
<tr>
<td>SWK 505</td>
<td>Generalist Practice with Communities and Organizations 2</td>
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<tr>
<td>SWK 506</td>
<td>Social Policy 2</td>
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<tr>
<td>SWK 507</td>
<td>Generalist Research Methods and Analysis 2</td>
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<tr>
<td>SWK 515</td>
<td>Generalist Practice Field Education I 3</td>
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<td>SWK 516</td>
<td>Generalist Practice Field Education Seminar I 1</td>
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<tr>
<td>SWK 517</td>
<td>Generalist Practice Field Education II 5</td>
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<tr>
<td>SWK 518</td>
<td>Generalist Practice Field Education Seminar II 1</td>
</tr>
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<td>Total Credits</td>
<td>24</td>
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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.

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:

<table>
<thead>
<tr>
<th>Concentration Courses</th>
<th>Total Credits</th>
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</thead>
<tbody>
<tr>
<td>SWK 527</td>
<td>Advanced Generalist Human Behavior and the Social Environment I 2</td>
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<tr>
<td>SWK 528</td>
<td>Advanced Generalist Human Behavior and the Social Environment II 2</td>
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<td>SWK 529</td>
<td>Advanced Generalist Research Methods and Analysis 2</td>
</tr>
<tr>
<td>SWK 530</td>
<td>Advanced Generalist Practice with Individuals 2</td>
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<tr>
<td>SWK 533</td>
<td>Advanced Generalist Practice with Families 2</td>
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<tr>
<td>SWK 534</td>
<td>Advanced Generalist Practice with Treatment Groups 2</td>
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<td>SWK 535</td>
<td>Advanced Generalist Practice with Communities 2</td>
</tr>
</tbody>
</table>

| Electives            | 3-5 |
| Total Credits        | 32-34 |

3. Completion of the research capstone, SWK 997 Independent Study (2 credits), or SWK 998 Thesis (4 credits).
4. Successful completion of comprehensive exam requirements.
5. Completion of at least 28 semester credits at UND. A maximum of 8 credits will be allowed for transfer.
6. 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.

Thesis Option:

1. Full-time students select a Faculty Advisory Committee 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.

Non-Thesis Option:

1. Full-time students select a faculty adviser by the end of the first semester in Concentration courses. Part-time students select a faculty adviser by the second semester they are enrolled 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 shape 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 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 II), 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, SWK 528, 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 550. 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.
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, sociological theory and social psychology with a minimum grade of B in each.

Degree Requirements

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. 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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 500</td>
<td>Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td>SOC 510</td>
<td>Sociological Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>SOC 511</td>
<td>Contemporary Sociological Theory</td>
<td>3</td>
</tr>
<tr>
<td>SOC 520</td>
<td>Advanced Research Design</td>
<td>3</td>
</tr>
<tr>
<td>SOC 521</td>
<td>Advanced Analytical Methods</td>
<td>3</td>
</tr>
<tr>
<td>SOC 528</td>
<td>Seminar in Research Methods</td>
<td>6</td>
</tr>
<tr>
<td>SOC 539</td>
<td>Seminar in Sociology (repeatable when topics vary)</td>
<td>7-9</td>
</tr>
<tr>
<td>SOC 569</td>
<td>Introduction to Social Entrepreneurship (requires admission into Social Entrepreneurship)</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cognates</th>
<th>7-9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 998</td>
<td>Thesis</td>
</tr>
</tbody>
</table>

Total Credits: 30-32

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. 3-4 Credits.

A critical look at problems of theory development and construction, emphasizing historical social theorists. Prerequisite: SOC 511.
SOC 520. Advanced Research Design. 3-4 Credits.
This course emphasizes the development of research design skills including survey research. Prerequisites: SOC 323 and SOC 326.

SOC 521. Advanced Analytical 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 design; and procedures. The student will apply the various analytical methods to available data. Prerequisites: SOC 323, SOC 326, and SOC 520.

SOC 522. Seminar in Research Methods. 3 Credits.
An examination of special topics in the field of research methods. Prerequisite: SOC 323.

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 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. F.

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 598. Individual Research. 1-4 Credits.
Repeatable to 6 credits. Repeatable to 6 credits.

SOC 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

SOC 997. Independent Study. 2 Credits.

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. Organizations and Behavior. 3 Credits.
A look at the different ways in which organizations can be conceptualized and studied. The relationships between organizational structure and individual behavior are examined. The study of the effects of environments, including other organizations, on organizational goals. The kinds of organizations studied include industrial, medical, educational and other types. Prerequisite: 6 hours of Soc or consent of instructor. 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. Prerequisite: SOC 301 or SOC 250 and CJ 330. On demand.

SOC 436. Social Inequality. 3 Credits.
An examination of various forms and modes of portraying human inequality. An investigation of the role of inequality in human affairs, its measurement and significance. Prerequisite: 6 hours of Soc or consent of instructor. On demand.

SOC 437. Population. 3 Credits.
A basic consideration of formal and social demography. The determinants and consequences of population change. Prerequisite: 6 hours of Soc or consent of instructor. 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. Prerequisite: 6 hours of Soc or consent of instructor. On demand.

SOC 492. Practicum in Sociology. 3 Credits.
Students enrolled in this practicum will be assigned to work on research under the direction of one or more faculty. The practicum is designed to provide directed research experience for those enrolled. Repeatable for a maximum of 6 credits. Prerequisites: SOC 301, SOC 323, SOC 326, and at least junior status. Repeatable to 6 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. Repeatable to 20 credits. Prerequisite: Consent of instructor. Repeatable to 20 credits. F,S.

Space Studies
http://www.space.edu/

FACULTY: Casler, de León, Dodge, Fevig (Graduate Program Director), Gaffey, Hardersen, Rygalov, and Seelan (Chair)

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, Ullrich, Vacek, Venhuizen and Watson

**FACULTY:** (SpSt) Casler, de León, Dodge, Fevig (Graduate Program Director), Gaffey, Hardersen, Rygalov, and Seelan (Chair)

#### 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 as follows: April 30 for the Fall semester; October 31 for Spring semester; and February 28 for Summer semester.

- **1. A 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 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).
5. One credit of SPST 590 Space Studies Colloquium (1 credit).
6. At least half of the total credit hours must be from classes at the 500-level and above.

#### Non-Thesis Option

1. SPST 997 Independent Study Report (2 credits).
2. Comprehensive Examination.
3. At least 4 elective courses (for distance students, the required Capstone course will count as one elective, so they only need 3).

#### Distance requirements

Distance students must also complete SPST 595 Space Studies Capstone (3 credits).

#### Thesis Option

1. SPST 593 Individual Research in Space Studies (1 to 3 credits).
2. SPST 998 Thesis (6 credits).
3. At least 2 elective courses.

Approval of the thesis option will only be granted if a clear alignment of research interests between a faculty member and a student is demonstrated, and a faculty adviser has been identified and is available to supervise the research. Distance students who wish to complete the thesis option must satisfy the residence requirement. Interested students should consult the School of Graduate Studies or department.

### 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**

- Niney 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
  - AVIT 501 General Issues in Aviation/Aerospace 3
  - SPST 501 Survey of Space Studies I 3
  - AVIT 521 Ethics in Aerospace 3
  - AVIT 590 Aviation Seminar 4
  & SPST 590 and Space Studies Colloquium 2-4
- 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>
<th>Course</th>
<th>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>
<tr>
<td>AVIT 521</td>
<td>Ethics in Aerospace</td>
<td>3</td>
</tr>
<tr>
<td>AVIT 590</td>
<td>Aviation Seminar</td>
<td>4</td>
</tr>
<tr>
<td>&amp; SPST 590</td>
<td>and Space Studies Colloquium (2 semesters, 2-4 credits total)</td>
<td></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</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIT 503</td>
<td>Statistics (or equivalent)</td>
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</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>
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</tr>
<tr>
<td>AVIT 507</td>
<td>Advanced Research Methods</td>
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</table>

**Course Designations (SPST)**

**Social area courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</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>
</tbody>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<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</th>
<th>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>
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<tr>
<td>SPST 521</td>
<td>The Planet Mars</td>
<td>3</td>
</tr>
<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>
</tr>
<tr>
<td>SPST 524</td>
<td>Current Topics in Astrobiology</td>
<td>3</td>
</tr>
<tr>
<td>SPST 525</td>
<td>Technical Issues in Space</td>
<td>1-3</td>
</tr>
<tr>
<td>SPST 526</td>
<td>Astronomical and Spacecraft Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>SPST 527</td>
<td>Extraterrestrial Resources</td>
<td>3</td>
</tr>
<tr>
<td>SPST 528</td>
<td>Space Environment and the Sun</td>
<td>3</td>
</tr>
<tr>
<td>SPST 570</td>
<td>Advanced Topics in Space Studies (may count towards either social or technical area depending on the contents.)</td>
<td>1-3</td>
</tr>
</tbody>
</table>

**Cognate/Minor**

The Department of Space Studies invites students from other programs who wish to expand their program of study to include a space-related focus. Our program includes a multidisciplinary set of course offerings that integrate well with other graduate programs. Students interested in space engineering, space business, space law, space policy, space science, space life sciences, space history, or military space can be accommodated. To complete a cognate or minor at the master’s level, students must take three courses for nine semester hours of credit. Our department will work with those doctoral students whose department requires additional credits for a minor degree.

**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 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 dissertation designs. 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 survey 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 sources 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 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 inter-disciplinary 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 inter-disciplinary 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 for 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 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 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 by solar eruptions including comets 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 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 GEG 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 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. 400))
Technology

Effective Fall 2016 the Master of Technology program has been suspended and no new applications are being accepted at this time.

http://business.und.edu/undergraduate/school-of-entrepreneurship/technology/

FACULTY: Chang, Johnson, Kokil, and O’Keefe (Chair)

Degree Granted: Master of Science (M.S.)

The Department of Technology offers two program options (thesis and non thesis) leading to the Master of Science. The program for the degree is designed on an individual basis to serve students who desire to go on to college, technical institute, or secondary level teaching, administration, or to technical/managerial careers in business, government or industry. Details pertaining to admission requirements, degree requirements and courses offered can be found in the Degree section.

Mission Statement and Program Goals

The Master of Science (M.S.) degree is available through the School of Entrepreneurship and is unique in that it provides students with the opportunity to University of North Dakota 629 individualize their program of study for further academic pursuits in colleges or universities, administration, or for technical/managerial careers in government, business and industry. Students in the M.S. program learn by doing and utilize a variety of technologies to conduct research, design or innovate, and solve problems of a technical nature. Classes in the Master’s program are small and enable faculty to work with students to achieve identifiable program or course goals. Graduates of our program use the M.S. degree to leverage career options within industry, government, and education. Some manage their own businesses and others who have worked to establish themselves in business ultimately become consultants, technical managers, directors, and in some cases CEOs. Your future is bright as a student in the MST program at UND where our students are the future.

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 from an accredited university or college.
2. An overall GPA of 2.75 (A=4.0) or GPA of at least 3.0 for the last two years of undergraduate study.
3. A minimum of 20 semester hours of undergraduate coursework in an area of instruction in an area of instruction in which our students are the future.
4. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.
5. A completed UND School of Graduate Studies application.
6. A completed Technology Department graduate student application.

An applicant who fails to meet these admission requirements may be admitted under provisional status. Students who do not meet requirement #3 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 Technology Department.

A. Thesis Option:

1. A minimum total of 30 credits are required, which includes 9 semester credits for approved minor in a department or cognate courses in other departments.
2. All credits applied towards the MST degree must be at 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. The following courses are required in the Thesis Option:

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<thead>
<tr>
<th>Course</th>
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<tr>
<td>EFR 515</td>
<td>Statistics I</td>
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<td>or EFR 516</td>
<td>Statistics II</td>
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<tr>
<td>TECH 500</td>
<td>Introduction to Graduate Studies</td>
<td>1</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>TECH 545</td>
<td>Seminar in Technology</td>
<td>1</td>
</tr>
<tr>
<td>TECH 575</td>
<td>Technical Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>TECH 998</td>
<td>Thesis</td>
<td>4</td>
</tr>
<tr>
<td>Minor/Cognate</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>30</strong></td>
<td></td>
</tr>
</tbody>
</table>

B. Independent Study Option:

1. A minimum total of 30 credits are required, which includes 9 credits for an approved minor in a department or cognate courses in other departments.
2. All credits applied towards the MST degree must be at 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. The following courses are required in the Independent Study Option:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 515</td>
<td>Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>or EFR 516</td>
<td>Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>TECH 500</td>
<td>Introduction to Graduate Studies</td>
<td>1</td>
</tr>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>TECH 545</td>
<td>Seminar in Technology</td>
<td>1</td>
</tr>
<tr>
<td>TECH 575</td>
<td>Technical Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>TECH 997</td>
<td>Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>Minor/Cognate</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>30</strong></td>
<td></td>
</tr>
</tbody>
</table>

C. Elective courses for Thesis or Independent Study Options:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH 510</td>
<td>Effects and Implications of Technology</td>
<td>3</td>
</tr>
<tr>
<td>TECH 530</td>
<td>Technology and Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>TECH 537</td>
<td>Graduate Cooperative Education</td>
<td>1-3</td>
</tr>
<tr>
<td>TECH 555</td>
<td>Lean: Ideas and Practice</td>
<td>3</td>
</tr>
<tr>
<td>TECH 570</td>
<td>Sustainability Challenges &amp; Opportunities</td>
<td>3</td>
</tr>
<tr>
<td>TECH 590</td>
<td>Special Topics in Industrial Technology</td>
<td>1-4</td>
</tr>
<tr>
<td>TECH 591</td>
<td>Readings in Technology</td>
<td>1</td>
</tr>
<tr>
<td>TECH 520</td>
<td>Innovation, Creativity &amp; Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

D. General:

1. Degree requirements identified by the School of Graduate Studies must be met.
2. The approved Program of Study must be completed.

Courses

TECH 500. Introduction to Graduate Studies. 1 Credit.
An overview of graduate studies to provide students with information about various areas of research, resources, and related topics in industrial technology. F.

TECH 510. Effects and Implications of Technology. 3 Credits.
A study of the people, activities, inventions, innovations, inputs, processes, and outputs of the systems integral to the technological development of our industrial society and the effects on and implications for contemporary society. S. even years.

TECH 520. Innovation, Creativity & Technology. 3 Credits.
This course examines the roles that people and technology play in developing and connecting ideas to create innovative products, processes, ideas, and technologies. Students are introduced to creative thinking tools and methods used to produce and sustain high levels of innovation. S. even years.
TECH 530. Technology and Entrepreneurship. 3 Credits.
This course introduces students to the entrepreneurial process, mindset, and relationship with technology, including technology as accelerator, leverage, language, trend, and widget that sits between ideas and the future. S, even years.

TECH 537. Graduate Cooperative Education. 1-3 Credits.
A relevant field experience in government, industry, or business. Students must have their internships approved by the department. S/U grading.

TECH 545. Seminar in Technology. 1 Credit.
A series of presentations on research pertaining to technology. Students will prepare, present, and discuss a professional research paper. Prerequisites: EFR 509 and consent of advisor. F.

TECH 555. Lean: Ideas and Practice. 3 Credits.
Introduces and discusses the concept of lean, including its past and present practice in industry and associated theories. Projects are designed to include various aspects of lean concepts. SS, odd years.

TECH 570. Sustainability Challenges & Opportunities. 3 Credits.
This course will begin with an overview of the three pillars of sustainability: the environmental, social, and economical demands, followed by the introduction of principles, concepts, and measurement of sustainability. Challenges and opportunities associated with environmental, social, and economical dimension will be discussed in the context of technology innovation and implementation. Students will also learn how to assess the feasibility of (technical) project deployment with sustainability in mind. F, odd years.

TECH 575. Technical Problem Solving. 3 Credits.
Research and experimentation relating to contemporary problems, issues, and application of electronics, production, or graphics techniques. SS, odd years.

TECH 590. Special Topics in Industrial Technology. 1-4 Credits.
Investigation of special topics dictated by individual student and faculty interests related to industrial technology and/or education. This course may be repeated to a total of 4 credits. Repeatable to 4 credits.

TECH 591. Readings in Technology. 1-3 Credits.
Examination of the professional literature in technology as part of an area of specialization or interest. Prerequisite: Consent of advisor. Repeatable to 3 credits. F, S, SS.

TECH 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

TECH 997. Independent Study. 2 Credits.

TECH 998. Thesis. 1-9 Credits.
Repeatable to 9 credits.

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 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.

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 500</td>
<td>Introduction to Research in Theatre Arts</td>
<td>2</td>
</tr>
<tr>
<td>THEA 501</td>
<td>Seminars in Theatre Arts</td>
<td>6</td>
</tr>
<tr>
<td>THEA 504</td>
<td>Dramatic Theory and Criticism</td>
<td>3</td>
</tr>
<tr>
<td>THEA 525</td>
<td>Period and Style in Dramatic Production</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Thesis</td>
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<td>4</td>
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</tbody>
</table>

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.
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.

THEA 998. Thesis. 1-6 Credits.  
Repeatable to 6 credits.

Undergraduate Courses for Graduate Credit

THEA 320. Voice and Movement III. 2 Credits.  
A sequential continuation of THEA 220. Vocal emphasis on shaping and muscularity of sounds and words, articulation, love of language and vocal flexibility. Physical emphasis on freedom, flexibility, and integration. Prerequisites: THEA 220. 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, crafts persons, 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, even 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 420. Voice and Movement IV. 2 Credits.  
A continuation of THEA 320 with emphasis on specialized and advanced voice and movement skills. Prerequisites: THEA 320. S.

THEA 422. American Theatre History. 3 Credits.  
The development of Theatre Arts in America from Colonial times to the present. 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.

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.

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.

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.  
A detailed examination of Shakespeare in performance. Prerequisite: THEA 371. F.

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,S.

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

Bruce A. Smith, 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 consortium 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 onboard the International Space Station, sophisticated computing labs, and the Arthur C. Anderson Atomsphereum — 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, a 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 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 all required aviation courses with a grade no lower than a “C.”
4. Complete the curriculum for the major as outlined in the departmental listings, and
5. 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, the Department of Aviation, in conjunction with the College of Business and Public Administration, offers the degree of Bachelor of Business Administration with majors in Aviation Management or Airport Management. Non-aviation degree seeking students may also earn minors in Aviation Management and Professional Flight. The curriculum for each of these programs is outlined under the specific departmental listings.

The graduation requirements for the Master of Science and Ph.D. degrees are outlined in the graduate section of the catalog.

The Department of Computer Science, through the John D. Odegard School of Aerospace Sciences, offers the degrees of Bachelor of Science, Bachelor of Arts, Master of Science in computer science, and Doctor of Philosophy in scientific computing. 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 2.00. (Note: computer science majors must earn a minimum cumulative GPA of 2.20 in all computer science courses).
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, the Department of Computer Sciences, in conjunction with the College of Arts and Sciences, awards the degree of Bachelor of Arts with a major in Computer Science. Students may also earn a minor in Computer Science. The curriculum for each of these programs is outlined under the specific departmental listings. 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 Space Studies, through the John D. Odegard School of Aerospace Sciences, offers an undergraduate minor in Space Studies and a Master of Science degree in Space Studies. A Ph.D. in Aerospace Sciences is also offered jointly with the Department of Aviation. 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
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.
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
departs. 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
- Fisheries and Wildlife Biology
- Forensic Science
- French
- General Studies
- Geography
- 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.

Certain students, e.g., those in the Honors Program, may graduate without a major or concentration.

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.

Nonprofit Leadership Certificate Program

As part of their bachelor’s degree program, students may earn the Nonprofit Leadership Certificate by completing the requirements listed in the Undergraduate Departmental listings in this catalog.

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. 616).

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 are not programs in the College of Arts and Sciences - please see the separate listings for them in this catalog under Nursing, PT and 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 in 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 in 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 be 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 in 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 in 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 be 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 in 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 be required by each school. Recommended curricula and a sample schedule for Pre-Physician Assistant courses are available in the Pre-PA Guide on the UND Pre-Physician Assistant website at http://arts-sciences.und.edu/pre-health/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 in 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 in 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 Program 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 in 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 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

Margaret L. Williams, 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. 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
The College of Business and Public Administration at the University of North Dakota is dedicated to creating and disseminating knowledge. At the undergraduate and graduate levels, the CoBPA emphasizes experiential learning to develop outstanding graduates who enhance their professions and communities. The CoBPA serves primarily the northern plains regions, while attracting students and engaging select organizations globally.

Five-Year Vision
The College of Business and Public Administration will become a leading institution in contributions to intellectual advancement. The CoBPA will enhance and build 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, Bachelor of Science in Graphic Design Technology, Bachelor of Science in Industrial Technology, 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. 83)). 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)). Also available to all students are minor programs in Public Administration, Leadership, Sport Business, Graphic Design Technology, and Industrial Technology emphasizing Electronic Technologies, Technical Design, and Manufacturing Technologies are also available. Finally, the College of Arts and Sciences offers minor programs in languages, including some (e.g., French) that have an orientation in business.

The College of Business and Public Administration also offers programs in cooperation with the College of Arts and Sciences. They include a major and minor in Economics.

The College offers a course that provides an overview of the many areas of focus in business; Introduction to Business (BADM 101) 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.
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 no grade lower than that of “C.”

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<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>
<td>3</td>
</tr>
<tr>
<td>ISIC 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
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<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>
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</tbody>
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Public Administration
A student pursuing a degree in public administration is admitted to the College as a Pre-Public Administration student. In order to be admitted to a program leading to the Bachelor of Science in Public Administration degree a student must have:
1. Satisfactorily completed at least 60 semester hours.
2. Earned at least a 2.50 GPA in the required Pre-Public Administration Core (refer to Public Administration section for core course listing).

Technology
A student pursuing a Bachelor of Science degree in Graphic Design Technology 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.

A student pursuing a Bachelor of Science degree in Industrial Technology 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 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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<td>MATH 146</td>
<td>Applied Calculus I</td>
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<td>POLS 115</td>
<td>American Government I</td>
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<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td>PSYC 111</td>
<td>Introduction to Psychology</td>
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<tr>
<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>Arts &amp; Humanities Electives (see notes)</td>
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<td>Free Elective</td>
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Sophomore Year

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<td>ACCT 200</td>
<td>Elements of Accounting I</td>
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<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td>3</td>
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<td>ECON 210</td>
<td>Introduction to Business and Economic Statistics</td>
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<td>Lab Science (see notes)</td>
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<td>ISBC 117</td>
<td>Personal Productivity with Information Technology</td>
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Notes

Students desiring to major in Airport Management or Aviation Management must: take ATSC 110 Meteorology I for laboratory science requirement. Students desiring to major in Information Systems must take PSYC 111 Introduction to Psychology instead of SOC 110 Introduction to Sociology or ANTH 171 Introduction to Cultural Anthropology. Students desiring to major in Management must take PSYC 111 Introduction to Psychology. In addition, SOC 110 Introduction to Sociology or ANTH 171 Introduction to Cultural Anthropology must be taken in place of the free elective.

Transfer Credits

Accredited university undergraduate business administration programs normally concentrate the professional courses in the last two years of a four-year program. Only a limited amount of work in business courses is offered below the junior year. 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 courses in business.

Students desiring a four-year degree are advised to take a majority of their work during the first two years in the arts and sciences, including a strong background in mathematics.

Students planning to take their first two years of work at a junior college should take only those courses in business that are offered as freshman or sophomore courses at the University of North Dakota and should access our articulation agreements for more information. Full lower division transfer credit will be granted for all courses equivalent to those specified for the freshman and sophomore years at the University of North Dakota.

Business administration courses taken at the freshman or sophomore level at another institution which are similar to junior or senior courses offered at the University of North Dakota will be accepted for transfer credit only if the student passes a validation examination covering each course for which transfer credit is sought. Students who take junior/senior upper division courses at unaccredited four-year schools may be required to take a validation examination. Transfer credit is not allowed for MGMT 475 Strategic Management, the capstone course for business degree programs at UND. Validation examinations are administered by the department responsible for the course(s) in question. Students desiring to validate courses taken at another institution should contact the College's Office of Academic Advisement, room 127, Gamble Hall.

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; B.S.G.D.T, Bachelor of Science in Graphic Design Technology; B.S.I.T, Bachelor of Science in Industrial Technology; 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 make formal application 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.I.T., B.S.G.D.T., and 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.

All candidates for the B.S.P.A. degree must meet the following requirements:

1. Be admitted to the public administration program.
2. Earn a minimum 2.50 GPA in all courses taken.
3. Earn a minimum 2.50 GPA in all UND courses taken.
4. Earn a minimum 2.50 GPA in public administration courses required for the major.
5. Earn a minimum 2.50 GPA in UND public administration courses required for the major.

Programs Beyond the Classroom

Internships

The College of Business and Public Administration, through its internship programs, provides undergraduate students 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. Our 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 as well as 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 EideBailly 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.

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.

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 College enjoys a strong relationship with Career Services in providing services to business students. Gamble Hall houses The Pancratz Career Development Center which serves the needs of the College of Business and Public Administration students and recent graduates as they prepare to enter the job market or to reassess their career plans. A variety of professional services are offered to include: resume and cover letter review, internship assistance, mentor programs, job searching, and remote and on-site interview support. Students continue to have the opportunity to interview with representatives from business, industry, and government that visit the campus each year for the purpose of hiring graduating seniors and graduate students who are completing advanced degrees. Students within the College
of Business and Public Administration can visit the center and explore career opportunities on center computers, reserve the conference room to participate in distance interviews, explore mentoring options, and participate in mock interviews.

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; Association of Information Technology Professionals; Association of Technology, Management and Applied Engineering; Arnold Air Society; Dakota Venture Group; Graphics and Photography Society; International Business Club; Management Club; MBA Student Association; Operations and Supply Chain Management Club; Phi Beta Lambda; Public Affairs Club; Student Society for Human Resource Management; and Student Managed Investment Fund.

Honor Societies

Student honor societies in the College of Business and Public Administration include Alpha Tau, Beta Alpha Psi, Beta Gamma Sigma, Delta Phi Epsilon, Epsilon Pi Tau, Omicron Delta Epsilon, Pi Sigma Alpha, Pi Omega Pi, and Sigma Iota Epsilon.
College of Education and Human Development

Robert Hill, 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 Recreation & Tourism Studies and Rehabilitation & Human Services); Educational Foundations and Research; Educational Leadership; Kinesiology and Public Health Education; and Teaching and Learning. Also affiliated with the College are the Bureau for Educational Services and Applied Research, the University Children’s Center, and the Center for Rural Education and Communities.

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, 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 five 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 continued 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. The department of Educational Leadership offers graduate programs for leaders in K-12 schools, higher education and other education organizations.

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.

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 programs in Recreation and Tourism Studies and Rehabilitation and Human Services joined the Counseling department.

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 the Accreditation of Teacher Education and approved by the state of North Dakota. The Doctoral Program in counseling 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 Recreation and Tourism Studies
- 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.

Bachelor’s degrees in:
- 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.

Bachelor’s degrees in:
- 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 in the Office of Advising and Admissions, Education Building at the start of each semester and also through the College of Education and Human Development’s web page. 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; 150 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
- Recreational and Tourism Studies
- 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, physical education professionals, teachers, school administrators, and other educational personnel for schools and institutions of higher education.

The M.S. with a major in Physical Education 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 a Ph.D., with concentrations in research methods or foundations of education. The Department of Educational Leadership offers a major in Educational Leadership for PK-12 school leaders with programs leading to the M.Ed., the Educational Specialist (Ed.S.), the Ed.D. and the Ph.D. The Department also offers a major in Higher Education with programs leading to the M.S., the Ed.D. and Ph.D. The Department of Teaching and Learning offers programs leading to the M.S. with majors in Early Childhood Education and Curriculum and Instruction and to the M.Ed. and M.S. with majors in Elementary Education, Reading Education, Special Education and Instructional Design and Technology. The M.Ed. is offered with a major in English Language Learners. Doctoral degrees, the Ed.D. and Ph.D. with a major in Teaching and Learning are offered with concentrations in Teacher Education, Higher Education and Instructional Design and Technology.
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, Geological 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, Geology, Mechanical Engineering, Accreditation for Petroleum Engineering is pending. 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 Office of Student Experience and Outreach (SEO).

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, 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, Geological Engineering and Geology, Mechanical Engineering, and Petroleum Engineering. Admission to graduate work in the various departments may be granted to a student upon the 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>
<tbody>
<tr>
<td>CE 306</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Any regularly offered course at the 200 or higher level with the prefix Engr, CHE, CE, EE, GE, ME or PtrE 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 2.00. 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 track required for professional engineering license.
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 and General Chemistry I and General Chemistry I Laboratory
   - **English Composition**
     - ENGL 110 or ENGL 130
   - **Calculus**
     - MATH 165 or MATH 265
   - **General Physics (calculus-based)**
     - PHYS 251 or PHYS 252

2. Additional science and engineering courses which may be prescribed by each admitting department.

3. A GPA of at least 2.00 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 exceed 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 2.00 overall GPA and 2.00 UND GPA in each degree program is required of all students in engineering. If either of these GPAs drop below 2.00, 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td></td>
<td></td>
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<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>MATH 165</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 122 &amp; 122L or CHEM 221 and CHEM 221L</td>
<td>General Chemistry II or Fundamentals of Chemistry - Concepts and Fundamentals of Chemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>MATH 166</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 201</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 200</td>
<td>Computer Applications in Engineering</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 130</td>
<td>Composition II: Writing for Public Audiences</td>
<td>3</td>
</tr>
<tr>
<td>MATH 265</td>
<td>Calculus III</td>
<td>4</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 and Mechanical Engineering which permit students to earn both B.S. and M.S./M.Engr. degrees in an engineering discipline. This program allows students to designate two three-credit hour courses to count for both degrees.

- Students may be admitted to the Engineering 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 - Engineering 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 Undergraduate 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).

For information on meeting times and activities, please see your departmental office or the Office of Student Experience and Outreach (SEO).

**Honor Societies**

Eta Kappa Nu, Sigma Gamma Epsilon, and Tau Beta Pi are engineering or geology honor societies whose purpose is to recognize excellence in the scholarship.

**Engineers’ Student Council (E-Council)**

The Engineers’ Council (E-Council) of the University of North Dakota is a student organization representing all departments of the College of Engineering and Mines. E-Council, as a student chapter of the National Society of Professional Engineers (NSPE), is open to students from all engineering disciplines. Its Council Body membership comprises the Executive Members of Engineers’ Council, the Vice Presidents of all active Engineering Student Organizations and Honor Societies, and the Engineering Student Senator. The purpose of E-Council is to foster student professional development and help create a sense of community between the engineering disciplines.

**Distance Engineering Degree Program**

The Distance Engineering Degree Program (DEDP) offers online access to accredited degree programs in Chemical, Civil, Electrical, Geological, Mechanical and Petroleum Engineering. The DEDP program includes summer on-campus laboratories and other laboratories via the internet.

On-campus courses are recorded and the files are available shortly thereafter through the internet to each student enrolled in DEDP. Through this program, students are able to complete their degree programs while taking the majority of their courses at their “home site.” Students are required to travel sometime during the summer months to the UND campus to complete the laboratory portions of their programs. Students have opportunities to interact with faculty through phone, email and internet. For further information please contact UND at 1-800-225-5863.
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 programs.

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 and 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: 701.777.3000 or toll-free 1.800.CALL.UND, 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: 701.777.3000 or toll-free 1.800.CALL.UND, by writing: Osher Lifelong Learning Institute, University of North Dakota, 3264 Campus Road, Stop 9021, Grand Forks, ND 58202-9021, 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, 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 701.777.3000 or toll-free 1.800.CALL.UND, e-mail to: UND.Info@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 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 701.777.3000, toll free 1.800.CALL.UND, 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

The Office of Conference Services is the “gateway” for conference management and event planning services available through the University of North Dakota. Services available include a state-of-the-art online registration database, budget coordination, event-specific website design, speaker management, CEU application preparation, event marketing, menu planning, creation of participant and exhibitor materials, onsite coordination, fiscal management and event evaluation tabulations. UND Conference Services works closely with business and organizations to create a successful event. Additional information can be obtained by calling 701.777.2663 or email to: UND.conferences@UND.edu (und.conferences@UND.edu). To see our complete list of services available and to request a proposal bid, visit our website at: http://conferences.UND.edu.

Summer Programs and Events Office

The Summer Programs and Events Office promotes all summer events, programs and courses to the greater Grand Forks community and beyond while providing leadership and logistical support for summer programming on the UND campus. The Office is located in Gustafson Hall, Room 201, phone 701-777-0841, http://summer.UND.edu.
School of Graduate Studies

Wayne Swisher, 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. 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 National Association of Graduate Admissions Professionals, the Center for Academic Integrity, the American Association of Collegiate Registrars and Admissions Officers, and the Midwest 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 (M.S.A.E.), Business Administration (M.B.A.), Public Administration (M.P.A.), and Technology (M.S.).


School of Medicine and Health Sciences: Anatomy & Cell Biology, Biochemistry & Molecular Biology, Pharmacology, Physiology, and Therapeutics, Medical Lab Science, Microbiology & Immunology, Occupational Therapy (M.O.T), Physical Therapy (D.P.T.), Physician Assistant Studies (M.P.A.S.), Public Health (M.P.H.)

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 fifteen 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. The Associate Dean of the School of Graduate Studies reports directly to the Dean and is primarily responsible for all aspects of School of Graduate Studies Assessment. 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.Engr.), 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.

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
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<tbody>
<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>
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<td>Art and Design (Visual Arts)</td>
<td>Master of Fine Arts (M.F.A.)</td>
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<td>Atmospheric Sciences</td>
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<td>Aviation</td>
<td>Master of Sciences (M.S.)</td>
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<tr>
<td>Biochemistry and Molecular Biology</td>
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<td>Biology</td>
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<td>Business Administration</td>
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<td>Chemistry</td>
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<td>Communication</td>
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<tr>
<td>Communication and Public Discourse</td>
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<td>Communication Sciences and Disorders</td>
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<tr>
<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>
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<td>Counseling</td>
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<td>Counseling Psychology</td>
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<tr>
<td>Criminal Justice</td>
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<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>
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<td>Economics (Applied Economics)</td>
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<td>Education</td>
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<td>Educational Foundations</td>
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<td>Teaching and Learning</td>
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<td>English Language Learners</td>
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<td>Civil Engineering</td>
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<td>Electrical Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Eng.), B.S./M.S./B.S./M.Eng. Combined Program</td>
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<td>Environmental Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Eng.)</td>
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<td>Geological Engineering</td>
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<td>Mechanical Engineering</td>
<td>Master of Science (M.S.), Master of Engineering (M.Eng.), B.S./M.S./B.S./M.Eng. Combined Program</td>
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<tr>
<td>Sustainable Energy Engineering</td>
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<td>English Language and Literature</td>
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<td>Geography</td>
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<td>Medical Laboratory Science</td>
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<td>Microbiology and Immunology</td>
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<td>Music</td>
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<td>Music Education</td>
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<td>Nursing and Professional Disiplines</td>
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<td>Doctoral Programs</td>
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<td>Adult-Gerontology Nursing (CNS or NP)</td>
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<td>Family Nurse Practitioner</td>
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<tr>
<td>Nurse Anesthesia</td>
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<tr>
<td>Nurse Educator</td>
<td>Master of Science (M.S.)</td>
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<tr>
<td>Psychiatric Mental Health Nursing (CNS or NP)</td>
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<td>Pharmacology, Physiology, and Therapeutics</td>
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<td>Physical Therapy</td>
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<td>Forensic Psychology</td>
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<td>General/Experimental Psychology</td>
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<td>Public Administration</td>
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<td>Space Studies</td>
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<td>Speech-Language Pathology</td>
<td>See Communication Sciences and Disorders</td>
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<td>Technology</td>
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<td>Theatre Arts</td>
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### Post Master’s Certificate Programs

#### Program Certificate

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<th>Program</th>
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<tr>
<td>Education</td>
<td>Certificate for Autism 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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<td>Instructional Design and Technology</td>
<td>Certificate in K-12 Technology Integration</td>
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<td>Certificate in eLearning</td>
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<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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<td>Certificate in Geographic Information Science</td>
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<tr>
<td>Geography</td>
<td>Certificate in Geographic Information Science</td>
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<td>Linguistics</td>
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<td>Certificate in Community Based Literacy as Applied Linguistics</td>
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<tr>
<td><strong>Nursing</strong></td>
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<tr>
<td>Certificate in Advanced Public Health Nurse</td>
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<tr>
<td>Certificate in Family Nurse Practitioner</td>
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<tr>
<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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<tr>
<td><strong>Public Administration</strong></td>
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<td>Certificate in Health Administration</td>
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<td>Certificate in Public Administration</td>
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<tr>
<td>Certificate in Policy Analysis</td>
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<tr>
<td>Certificate in Social Entrepreneurship</td>
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</tbody>
</table>
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 any setting and reflects a relatively small 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 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.

Students wishing to enter the School of Law should visit the Future Students website at: http://law.und.edu/future-students. Information can also be requested by contacting the Office of Student Life at 701-777-2047 or Office of Student Life, School of Law, University of North Dakota, 215 Centennial Drive, Stop 9003, Grand Forks, ND 58202-9003. The University of North Dakota School of Law is a participating law school in the Law School Admission Council, Credential Assembly Service (CAS).

Applicants for advanced standing may be admitted and given credit for satisfactory work completed in other accredited and international law schools, provided they otherwise comply with the admission requirements of the School of Law.

Students in Other Colleges or Schools Electing Law Courses

The School of Law permits non-Juris Doctor degree candidates to enroll in law school courses on a limited basis. Undergraduate UND students will generally not be permitted to enroll in law school (JD curriculum) courses. UND graduate students may be permitted to enroll in law school courses with the permission of the dean upon appropriate petition. Interested students should contact the School of Law’s Office of Student Life for further information.

Library

The Thormodsgard Law Library provides resources and services to support and strengthen the teaching, scholarship, research, and service programs of UND School of Law students and faculty. As a state-assisted academic institution, the law library also serves as a source of legal information for the University of North Dakota community, the bench and bar, and the public. The law library collection, whether in print or electronic format, provides access to resources such as case reporters, statutes, constitutions, legislative process materials, administrative materials, treatises, periodicals, and selected non-legal resources. Dedicated librarians and staff help library patrons to access and use the materials and databases.

Additional Information

Additional information for the School of Law describing degree requirements, course offerings, financial aid and scholarships, student organizations and activities, faculty biographies, placement and other miscellaneous information is available on the School of Law’s website at: law.und.edu.
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. Biomedical science graduate programs in the Department of Basic Sciences leading to the M.S. degree, Ph.D. degree, and the combined M.D./Ph.D.
5. Postdoctoral research training programs in the biomedical sciences.
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; 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 the biomedical sciences. 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 a 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 Health 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 basic 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 must include the following mandatory credits:

<table>
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<th>Minimum Semester Hours</th>
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<tbody>
<tr>
<td>Chemistry, including laboratory</td>
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<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>
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<tr>
<td>Language Arts (English, Speech, etc.)</td>
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<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).

Histotechnician Certificate Program

The Department of Medical Laboratory Science offers a Histotechnician Certificate Program. The certificate requires completion of prerequisite coursework before applications will be accepted. 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

The Ph.D., M.S. and joint M.D./Ph.D. programs are offered in the Department of Basic Sciences. 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 acoateline.org (http://www.acoteline.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/mygradspace.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: www.med.und.nodak.edu/physicianassistant (http://www.med.und.nodak.edu/physicianassistant).

Public Health

Established in 2012, the Master of Public Health program has the goal of producing well-educated graduates who are passionate about health improvement and are able to provide public health expertise and leadership at the local, state, national and international levels. In addition to a core curriculum, UND offers unique specializations that include Population Health Analytics and Health Management & Policy. Working in cooperation with the MPH program at North Dakota State University, the programs provide comprehensive public health training and service to North Dakota and the Northern Plains. 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 medical school complex includes additions which house the basic sciences departments, the Harley French Library of the Health Sciences, classrooms and offices at the site of the former St. Michael's Hospital. The additions provide state-of-the-art research laboratories and learning space for programs in the health sciences. In 2000, the Biomedical Research Facility, an ultra-modern animal facility, was completed. In August 2001, the University Health Facility opened at Sixth Avenue North and Hamline Street. It houses the Clinical Education Center, the Evan Lips Auditorium and a dedicated human patient simulation lab with multiple high-tech simulators. In the fall of 2004, the Neuroscience Research Facility opened at Hamline and Fifth Avenue North, immediately west of the medical school complex. It houses laboratories for research investigations into neurodegenerative diseases, such as Parkinson’s and Alzheimer’s, as well as drug addiction. At Minot, in spring 2005, the UND Center for Family Medicine moved into a new building in the northwest area of the city; it also houses the Northwest Campus office and a branch of the Center for Rural Health. At Bismarck, in Fall 2012, the UND Center for Family Medicine moved into a new building; it also houses the southwest campus office. Construction of a new building for the School of Medicine and Health Sciences is underway. Due to open in July 2016, the new building is designed to accommodate future growth of medical and graduate education programs and research.
Mission, Vision, Values and Goals

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.

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 and Professional Disciplines believes in empowerment of students, individuals and communities. Scholarship, collaboration, 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.

The College of Nursing and Professional Disciplines offers professional programs with a foundation in the liberal arts leading to undergraduate degrees in nursing, community nutrition, dietetics and social work. Students who wish to pursue an undergraduate degree in nursing should visit the College of Nursing and Professional Disciplines (CNPD) website for further information.

The department of nursing offers undergraduate and graduate degrees in nursing. Students are encouraged to visit the College of Nursing and Professional Disciplines (CNPD) website for further information.

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.)
- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)
- Doctor of Nursing Practice (DNP)

All programs within the College of Nursing and Professional Disciplines have minimum grade point averages that must be maintained.

Licensing

Professional programs of nursing and nutrition are accountable to the public through licensure and registration processes. Many nursing and nutrition 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.

The College of Nursing and Professional Disciplines offers graduate and undergraduate degrees in nursing. Students are encouraged to visit the College of Nursing and Professional Disciplines (CNPD) website for further information.

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)
- 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. 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 and 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
- Advanced Public Health Nurse
- Nursing Education

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.

Scholarships and Financial Aid

Each year, nursing majors may apply for CNPD scholarships. Awards and criteria are listed in the CNPD Office of Student Services website. Selection is based on a variety of factors including GPA, financial need, disadvantaged background, interest, and potential nursing 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.

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.

Nutrition and Dietetics

Academic Advising

Students are assigned to an adviser in the Department of Nutrition and Dietetics at the time of admission to the university if the student has declared a 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 (see department listing). There may be on-going curricular changes since the Department of Nutrition and Dietetics strives to reflect current trends in the profession.

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 dietitians (RD). Upon completion of this degree, graduates are eligible to take the examination for professional registration.

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 a personal interview with each selection committee member. 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-admission application. Re-admission 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 experiences, graduates will be skilled in conducting community nutrition assessments, identifying problems, developing and conducting effective interventions, and collaborating with other professionals involved 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.

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 from the department.

Student Organizations

Student Association of Nutrition and Dietetics (SAND)

SAND is the student association for all majors 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.

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 UND student government, including students with majors in the Department of Nutrition and Dietetics.
Student Success Center

History and Scope
The Student Success Center was created in the fall of 2007 as a result of combining the Adult Re-entry Center, Student Academic Services, and the University Learning Center, to provide 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 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.

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 orientation, 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.

Additional Information
For detailed information on the summer program, students should consult the Summer Sessions web site at: www.und.edu/academics/summer-sessions.

Summer Programs and Events Office
The Summer Programs and Events Office coordinates summer activities on the UND campus, and promotes and markets them to the Greater Grand Forks community and beyond. These include educational seminars, professional conferences, sports clinics, specialized workshops and social events that are essential to UND’s overall mission as an educational institution and as a member of the community. A Start-Up Mini-Grant Program is also available, which helps cover the development, marketing and start-up costs for Summer Programs and Events. The office is located in Gustafson Hall, 701-777-0841, or visit our website at http://und.edu/academics/extended-learning/summer/.
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, 2016
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
Stamen, Greg, Fort Ransom, term expires June 30, 2019
Student Member, named annually to one-year term
Non-voting Faculty Member, named annually to one-year term
Non-voting Staff Member, named annually to one-year term
Hagerott, Mark, Chancellor, North Dakota University System

Administration

Schafer, Edward T., B.S.B.A., M.B.A., Hon. Litt. D., President
Borknet, Patricia, Executive Assistant to the President
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
Reesor, Lori, Ph.D., Vice President for Student Affairs
Walton, Susan, Vice President for University and Public Affairs, B.I.S., M.A.
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
Chakraborty, Dave, B.S., M.S., PE, Associate Vice President for Facilities
Hanson, Pat, B.S., B.A., Director, Human Resources and Payroll Services
Miller, John, J.D., Special Assistant and Export Control Officer
Plummer, Eric, B.A., M.A., Associate Vice President for Public Safety, University Police Chief
Rerick, Tim, B.S., B.A., Director, Internal Auditing
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
Aboul, Terry, Assistant to the Vice President for Research and Economic Development
Bowles, Michelle, M.P.A., CIP, Coordinator, Institutional Review Board
Gregory, Dave, M.P.A., UND Alumni Association & Foundation Director of Corporate & Foundation Relations
Hoffmann, Mark, Ph.D., Associate Vice President for Research Capacity Building; Director, Computational Research Center; ND EPSCoR Associate Project Director
Hurst-Torgerson, Linda, B.Acc., Program Manager, Grand Forks Human Nutrition Research Center
Lee, Kap J., DVM, M.S., DAICLAM, Director, Center for Biomedical Research
Milavetz, Barry, Ph.D. Associate Vice President for Research and Economic Development, Research Development and Compliance
Miller, John, J.D., Export Control Officer
Moore, Michael, M.S., C.L.P., Associate Vice President for Intellectual Property Commercialization and Economic Development
Rusk, Kevan, B.S.M.E., Director, Technology Accelerator
Reesor, Lori, Ph.D., Vice President for Student Affairs
Betting, Laurie, P.T., D.P.T., Associate Vice President for Health and Wellness
Burger, Lisa, M.A., Assistant Vice President for Student Academic Services
Carlson, Kenneth, Ph.D., Director, Counseling Center
Carpenter, Angie, M.A., Director, Student Success Center
Croeker, Jane, B.S.S.W., Health and Wellness Promotions Specialist
Estlinger-Schneider, Michelle, M.B.A., 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., Assistant Dean of Students
Glennen, Deb, M.Ed., Director, Disability Services for Students
Grew-Gilien, 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
Jensen, Sol, M.Ed., Assistant Vice President for Enrollment Services
Kilgore, Janelle, M.S., Director, Financial Aid
Lindenberg, Joshua, M.P.A., Director, One Stop Student Services
Nilles, Dawnita, M.S., Director, University Children’s Learning Center
Nissen, Sarah, M.A., Director, Student Affairs Marketing
Odegard, Ilene, M.A, Director, Career Services
Pokornowski, Alexander, M.Ed., Director of Judicial Affairs and Crisis Programs
Puhl Winkler, Jennifer, M.B.A., Director, Wellness Center

University of North Dakota
Sporbert, Derek, M.B.A., Director, TRIO Programs
Trainer, Jason, M.S., Director, Admissions
Vacant, Director, Student Affairs Technology Services

**Walton, Susan B., M.A., APR, Fellow PRSA, Vice President for University and Public Affairs**
Brode, Barry, M.S., Director of Television and Radio
Caraher, Susan, B.A., Director of Campus Client Services
Johnson, Peter, B.A., B.S.Ed., Executive Associate Vice President for University Relations
Novotny, Jill, B.S., Administrative Officer and HR Manager
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., Associate Dean for Medicine
Combs, Colin, Ph.D., Chair, Basic Sciences
Dorscher, Joyce, M.D., Associate Dean for Student Affairs and Admissions
Eken, Randy, M.P.A., Associate Dean, Administration and Finance
Haas, Gwen Wagstrom, M.D., M.B.A., Senior Associate Dean, Academic and Faculty Affairs
Hart, Gary, Ph.D., Director, Center for Rural Health
Miedema, Dave, Director of Development, School of Medicine and 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
Dopperalski, 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
Galbraith, 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
Helwig, 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
Klupinski, 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, Brenna, 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, Associate 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
Schwenzfeirer, 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
Varnadoe, 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
Kroeber, 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 location 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 M.A., Seattle University, Clinical Assistant Professor of Nursing
* Ahlerein, Marissa A., Ph.D., University of Missouri, Adjunct Professor of Biology
* 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
Altepeter, Sheri, B.S.N., University of North Dakota, Clinical Instructor of Nursing
* 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
*** Andersson, Julie A., University of North Dakota, Assistant Professor of Family and Community Medicine, PA-C
* Angelone, Alison, M.F.A, Virginia Commonwealth University, Assistant Professor of Theatre Arts
** Antonova, Slavka, Ph.D., Concordia University, Montreal, Associate Professor of Communication
Aregood, Richard, Ph.D., Rutgers University, Associate Professor of Communication Sciences and Disorders
** Askelson, Mark, Ph.D., University of Oklahoma, Professor of Atmospheric Sciences
** Askim-Lovseth, 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
** Bagheri, Fatollah, Ph.D., University of Pennsylvania, Professor of Economics
# Baker, Todd Adam, Ph.D., University of Arizona, Adjunct Professor of Linguistics
* Baker, Brent, Ph.D, University of South Florida, Associate Professor of Marketing
** 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 Physics
** Barrentine, Shelby, Ed.D., University of California-Los Angeles, Professor of Teaching and Learning
*** Barry, Scott, Ph.D., Arizona School of Health Sciences, Assistant Professor of Family and Community Medicine/Physician Assistant Program
* Basgier, 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, William K., Ph.D., M.D., University of Minnesota, Professor of Surgery
Becker, Karin, Instructor of Information Systems Business Communication
* Beneda, Nancy L., Ph.D., St. Louis University, Professor of Finance
* Benoit, Virgil, Ph.D., University of Minnesota, Professor of Languages
Berg, Frances M., M.S., University of Minnesota, Adjunct Professor of Family and Community Medicine
* Berg, Justin, Ph.D., Washington State University, Assistant Professor of Sociology
Berg Burin, Nikki, Ph.D., University of North Dakota, Assistant Professor of History
** Berger, Albert, Ph.D., Northern Illinois University, Associate Professor of History
* 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
Biberdorff, Peggy, M.S., Minot State University, Clinical Instructor of Communication Sciences and Disorders
# Bickford, Albert Albert, Ph.D., University of California, San Diego, Adjunct Professor of Linguistics
** Biederman, Daniel, Ph.D., University of Kansas, Professor of Economics
Birger, C. Judith, M.S., University of North Dakota, Clinical Instructor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing and Professional Disciplines
Birkhofer, Melissa, M.A., Chapel Hill, Assistant Professor of Languages
* Bishop, Jewel, Ph.D., Arizona State University, Assistant Professor of Nursing
** Bishop, Elizabeth L., Ph.D., University of North Dakota, Professor of Aviation
Bjerke, Marilyn R., M.S., University of North Dakota, Clinical Assistant Professor of Nursing
# Black, Andrew Andrew, Ph.D., University of California, Santa Cruz, Adjunct Professor of Linguistics
# Black, Cheryl A., Ph.D., University of California, Santa Cruz, Adjunct Professor of Linguistics
* Beard, Victoria, Ph.D., Indiana University, Associate Professor of Music
** Blackburn, Royce, D.M.A., Indiana University, Associate Professor of Music
* Blake, Michael J., M.Ed., University of North Dakota, Professor of Music
# Blass, Regina, Ph.D., London University, Adjunct Professor of Linguistics
Blehm, Julie A., M.D., University of North Dakota, Associate Dean for Medical School, Southeast Campus at Fargo, Associate Professor of Internal Medicine and Clinical Associate Professor of Family and Community Medicine
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
** DiCristina, Bruce, Ph.D., State University of New York-Albany, Professor of Criminal Justice
** Dixon, Kathleen, Ph.D., University of Michigan, Professor of English
Dockter, Bruce, M.Eng., University of North Dakota, Lecturer of Civil Engineering
Donald, J., Douglas, Ph.D., University of South Dakota, Professor of Psychology
** Donehower-Weinstein, Kimberly, Ph.D., University of Minnesota-Twin Cities, Associate Professor of English
** Dong, Xiquan, Ph.D., Pennsylvania State University, Professor of Atmospheric Sciences
Donnell, Sheryl, Ph.D., University of Arizona, Professor of English
* Dosch, Robert, Ph.D., University of Iowa, Associate Professor of Accountancy
** Doze, Van A., Ph.D., Stanford University, Associate Professor of Basic Sciences
* Drago, Alejando, D.M.A., University of Southern Mississippi, Associate Professor of Music
*** Drechsel, Paul, M.S., University of North Dakota, Associate Professor of Aviation
** Du, Goudong, Ph.D., Iowa State University, Associate Professor of Chemistry
** Dunlevy, Jane R., Ph.D., University of Alabama at Birmingham, Associate Professor of Basic Sciences
** Dunnigan, Gerri, Ph.D., Iowa State University, Associate Professor of Mathematics
Dusenbury, Mark, M.S., University of North Dakota, Associate Professor of Aviation
Dye, Sara K., M.D., Dartmouth Medical School, Adjunct Assistant Professor of Rural Health
* Edwards, Sarah, M.S., North Dakota State University, Assistant Professor of Counseling Psychology and Community Services
** El-Rewini, Hesham, Ph.D., Oregon State University, Dean, College of Engineering Mines and Professor of Computer Science
** Elbert, Dennis, Ph.D., University of Missouri-Columbia, Professor of Entrepreneurship
Elenwood, Dan, Lecturer in Aviation
* Ellington, Dee Ann, Ph.D., Virginia Polytechnic Institute and State University, Associate Professor of Accountancy
** Ellis-Felege, Susan, Ph.D., University of Georgia, Assistant Professor of Biology
Enger, Tracy Jo, M.S.N., University of North Dakota, Clinical Instructor of Nursing
Ernst, Julia, J.D., University of Michigan, Associate Professor of Law
Evans, Julie, J.D., University of North Dakota, Adjunct Assistant Professor of Family and Community Medicine
** Evanson, Tracy, Ph.D., University of Minnesota, Director, APHN and Associate Professor of Nursing
Faircloth, James, D.B.A., Mississippi State University, Associate Professor of Marketing
** Faruque, Saleh Muhammad, Ph.D., University of Waterloo-Ontario, Associate Professor of Electrical Engineering
** Fazel-Rezai, Reza, Ph.D., University of Manitoba, Associate Professor of Electrical Engineering
Fellege, Christopher, M.Ed., University of Georgia, Instructor of Biology
** 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
Finstad, Alison, Ph.D., University of North Dakota, Assistant Professor of Psychology
** Fiorio, Richard, Ph.D., University of Illinois-Urbana, Professor of Communication
* 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
Flatt, John, M.S., ATC, North Dakota State University, Instructor of Family and Community Medicine-Sport Medicine
* Fleshman, 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
** Flower, Ann M., Ph.D., University of Colorado Health Sciences Center, Associate Professor of Basic Sciences
** Flynn, David T., Ph.D., Indiana University, Professor of Economics
* Flynn, Michael, Ph.D., Washington University, St. Louis, Associate Professor of English
Fogarty, Edward F., M.D., University of Nebraska-Omaha, Clinical Assistant Professor and Chair of Radiology
Foltz, Kenneth, M.S., Central Missouri State University, Assistant Professor of Aviation
Fontaine, Cordell, M.A., University of North Dakota, Director of Social Science Research Institute
** Forsman, Nels F., Ph.D., University of North Dakota, Assistant Professor of Geology and Geological Engineering
* Foster, James D., Ph.D., University of North Dakota, Assistant Professor of Basic Sciences
** Fox, Lavonne, Ph.D., University of North Dakota, Associate Professor of Occupational Therapy
** Francis, Clare, Ph.D., Indiana University, Associate Professor of Management
Frazier, Alan, M.P.A., University of Southern California, Assistant Professor of Aviation
Fritz, Christine, J.D., University of Oklahoma, Assistant Professor of Law
Fugere, Robert M., B.A., University of North Dakota, CPT, United States Army and Assistant Professor of Military Science and Leadership
** Gaffey, Michael, Ph.D., Massachusetts Institute of Technology, Professor of Space Studies
Gaines-Stoner, Kelly, J.D., University of Oklahoma, Clinical Instructor of Law
*** Gallo, Michael, M.S., Minnesota State University, Moorhead, Assistant Professor of Teaching and Learning
** Garrett, Scott, Ph.D., University of South Dakota, Associate Professor of Pathology
Gasevic, Enj, M.D., University of North Dakota, Assistant Professor of Surgery
* Gedafa, Daba, Ph.D., Kansas State University, Assistant Professor of Civil Engineering
** Geiger, Jonathan, Ph.D., University of North Dakota, Chester Fritz Distinguished Professor of Basic Sciences
** Geria, Philip, Ph.D., University of North Dakota, Professor of English and Geological Engineering
Gerszewski, Tammy, Clinical Assistant Professor of Accountancy
** Ghibi, Othman, Ph.D., Rene Descartes University, Associate Professor of Basic Sciences
Gibbens, Brad, M.P.A., University of North Dakota, Assistant Research Professor of Family and Community Medicine, Associate Director, Center for Rural Health
** Gilmore, Matthew, Ph.D., Texas AM University, Associate Professor of Atmospheric Sciences
* Gjellstad, Melissa, Ph.D., University of Washington, Associate Professor of Languages
** Goenner, Cullen, Ph.D., University of Wisconsin, Professor of Economics
** Goldsteen, Raymond, DrPH, Columbia University, Director and Professor of Master of Public Health
** Goldsteen, Karen, Ph.D., Professor of Public Health
** Golovko, Mikhail, Ph.D., Tver State University, Associate Professor of Basic Sciences
* Gonzalez-Smith, Suzanne, M.F.A., University of Kentucky, Associate Professor of Art and Design
** Goodwin, Brett, Ph.D., Carleton University, Ottawa, Associate Professor of Biology
** Goodwin, Janice K., Ph.D., Iowa State University, Associate Professor of Nutrition and Dietetics
Gordon, Gregory, J.D., University of California, Associate Professor of Law
** Gosnold, William D., Ph.D., Southern Methodist University, JR., Chester Fritz Distinguished Professor of Geology and Geological Engineering
** Gottschalk, Martin, Ph.D., State University of New York-Albany, Associate Professor of Criminal Justice
** Gourreau, Bonni, Ed.D., University of North Dakota, Associate Professor of Teaching and Learning
Grandbois, Donna, M.S., University of North Dakota, Clinical Instructor of Nursing
** Grant, Emanuel, Ph.D., Colorado State University, Associate Professor of Computer Science
*** Grave, Shannon, M.Ed., University of North Dakota, Instructor of Teaching and Learning
* Gray, Jacqueline, Ph.D., Oklahoma State University, Associate Research Professor, Center for Rural Health

* Grewal, Nanak S., Ph.D., University of Illinois-Chicago, Professor of Mechanical Engineering

* Griffin, Michelle, Ph.D., University of North Dakota, Clinical Supervisor, Teaching and Learning

Grijalva, James, J.D., Northwestern School of Law, Professor of Law

** Grove, Byron D., Ph.D., Clemson University, Associate Professor of Basic Sciences

* Gullicks, Harvey, Ph.D., Iowa State University, Associate Professor of Civil Engineering

* Gupta, Surojit, Ph.D., Drexel University, Assistant Professor of Mechanical Engineering

** Guy, Mark, Ph.D., University of Georgia, Professor of Teaching and Learning

* Halaska, Gwendolyn, M.D., Harvard Medical School, Senior Associate Dean of Education and Faculty Affairs and Associate Professor of Family and Community Medicine

* Halcrow, Cheryl Lynn, Ph.D., University of North Dakota, Associate Professor of Mathematics

Hamami, Nasser, M.S., University of North Dakota, CIO, Information Resources and Assistant Professor of Family and Community Medicine

Hand, Laura, Assistant Professor of Political Science Public Administration

** Hans, Birgit, Ph.D., University of Arizona, Professor of Indian Studies

Hanson, Darlene, M.S., University of North Dakota, Clinical Associate Professor of Nursing

** Hanson, Debra J., Ph.D., North Dakota State University, Associate Professor of Occupational Therapy

Hanson, Kimberly, M.S.W., University of North Dakota, Assistant Professor of Social Work

Hanson, Sheila, Assistant Professor of Entrepreneurship

* Hardersen, Paul, Ph.D., Rensselaer Polytechnic Institute, Associate Professor of Space Studies

Harmeson, Phillip, J.D., University of North Dakota, Associate Professor of Accountancy

* Harris, Elizabeth, M.F.A., University of Arkansas, Professor of English

Harris, Nicole, M.S., University of North Dakota, Instructor of Occupational Therapy

* Harsell, Christine, M.S., Syracuse University, Clinical Assistant Professor of Nursing

** Harsell, Dana M., Ph.D., Syracuse University, Associate Professor of Political Science and Public Administration

Hart, L. Gary, Ph.D., University of Washington, Director of the Center for Rural Health and Professor of Family and Community Medicine

** Hartman, Joseph H., Ph.D., University of Minnesota, Professor of Geology and Geological Engineering

** Haselton, James R., Ph.D., University of Miami at Coral Gables, Assistant Professor of Basic Sciences

* Haskins, Anne M., Ph.D., University of North Dakota, Associate Professor of Occupational Therapy

* Haskins, James P., Ph.D., Colorado State University, Assistant Professor of Finance

* Hastman, Tanis, Ph.D., Kansas State University, Assistant Professor of Physical Education, Exercise Science and Wellness

# Hawthorne, Joan, Ph.D., University of North Dakota, Assistant Professor of Educational Foundations and Research

** Healy, Margaret, Ph.D., Iowa State University, Professor of Educational Leadership

* Hebert, Todd, M.F.A., Rhode Island School of Design, Assistant Professor of Art and Design

*** Heintz, Lucy, M.S., University of North Dakota, Clinical Assistant Professor of Nursing

** Heikamp, Thomasine, M.S.W., University of Wisconsin-Madison, Professor of Social Work

** Helleloid, Duane, Ph.D., University of Washington, Professor of Management

Henderson, Thomas, Ph.D., University of North Dakota School of Medicine and Health Sciences, Research Assistant Professor of Basic Sciences

Hendrickx, Kris, DNP, University of Minnesota, Clinical Associate Professor of Nursing

** Henry, L. Keith Keith, Ph.D. University of Tennessee-Knoxville, Associate Professor of Basic Sciences

Higgenbotham, Brian, DNS, University of Tennessee, Clinical Associate Professor of Nursing

*** Higgins, James, M.S., University of North Dakota, Associate Professor of Aviation

** Hightower, Sean, Ph.D., University of Wyoming, Assistant Professor of Chemistry

** Hill, Michael J., Ph.D., University of Sydney, Australia, Professor, Earth System Science and Policy

** Hill, Thomas M., Ph.D., University of Colorado Health Sciences Center, Assistant Dean for Pre-Clinical Education, Director, Office of Medical Education and Professor of Basic Sciences

Hill, Emily, M.A., University of North Dakota, Instructor of Honors

Hoffman, Katherine M., M.S., University of Mary, Assistant Professor of Pathology

* Hoffmann, Mark R., Ph.D., University of California, Chester Fritz Distinguished Professor of Chemistry

** Holdman, Linda, Ph.D., University of North Dakota, Assistant Professor of Teaching and Learning

** Holen, Jodi, Ph.D., University of North Dakota, Associate Professor of Teaching and Learning

** Hollingsworth, David, Ph.D., University of Minnesota, Professor of Management

* Holm, Jeffrey E., Ph.D., Ohio University, Professor of Psychology

* Hong, Doojin, Ph.D., University of Iowa, Associate Professor of Mathematics

* Hosford, Charles C., Ph.D., University of North Dakota, Senior Statistician, Office of Medical Education and Assistant Professor of Family and Community Medicine

Hostetter, Jeffrey, M.D., University of Washington School of Medicine, Director, Center for Family Medicine, Bismarck and Assistant Professor of Family and Community Medicine

Hou, Xiaodong, Ph.D., Shanghai Jiao Tong University, Lecturer of Engineering

* Houghton, Terri, M.Ed., University of North Dakota, Instructor of Teaching Learning

** Hu, Wen-Chen, Ph.D., University of Florida, Associate Professor of Computer Science

** Huang, Xiaozhao, Ph.D., Ball State University, Associate Professor of English

* Hultquist, Andy, Ph.D., Ohio State University, Associate Professor of Political Science and Public Administration

** Hume, Wendelin, Ph.D., Sam Houston State University, Associate Professor and Chair of Criminal Justice

** Hung, Woei, Ph.D., University of Missouri-Columbia, Professor of Teaching and Learning

** Hung, Hsin-Ling (Sonia), Ph.D., The Ohio State University, Research Scientist, Educational Foundations and Research

* Hunter, Cheryl, Ph.D., Indiana University, Assistant Professor of Educational Foundations and Research

Hurley, Roxanne, M.S., University of North Dakota, Associate Dean of Undergraduate Studies and Clinical Associate Professor of Nursing

Hutchison, Ashley, Ph.D., Ball State University, Assistant Professor of Counseling Psychology Community Services

** Iiams, Joel, Ph.D., Colorado State University, Professor of Mathematics

** Iiams, Michele, Ph.D., University of North Dakota, Professor of Mathematics

Ilchuk, Yuliya, Ph.D., Assistant Professor of Languages

* Ingle, Ronnie, D.M.A., University of North Carolina, Associate Professor of Music

** Ingwalson, Gail, Ph.D., University of North Dakota, Associate Professor of Teaching and Learning

** Isenminger, Gordon L., Ph.D., University of Oklahoma, Chester Fritz Distinguished Professor of History

Iszler, Donna, M.A., North Dakota State University, Clinical Associate Professor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing and Professional Disciplines

Jabbari, Hadi, Ph.D., University of North Dakota, Assistant Professor of Petroleum Engineering

Jackson, Margaret Moore, J.D., University of San Francisco, Associate Professor of Law

*** Jacobson, Amy, M.Ed., University of North Dakota, Instructor of Teaching and Learning

* Janssen, Scinda, B.S., University of North Dakota, Associate Professor of Occupational Therapy

Jarrell, Heather, Ph.D., Ohio State University, Assistant Professor of Anthropology

* Jayasundara, Dheeshana, Ph.D., University of Texas, Assistant Professor of Social Work

** Jedlicka, Janet, Ph.D., University of Mississippi, Professor and Chair of Occupational Therapy

* Jendrysik, Mark, Ph.D., University of North Carolina at Chapel Hill, Professor of Political Science and Public Administration

Jenny, Ruth, J.D., University of North Dakota, Clinical Assistant Professor of Law
** Jeno, Susan H., Ph.D., University of North Dakota, Associate Professor of Physical Therapy
** Jensen, Jason, Ph.D., University of Kentucky, Associate Professor of Political Science and Public Administration
Jensen, Mark O., M.D., University of Minnesota School of Medicine, Professor of Surgery
* Jensen, Warren C., M.D., University of California, San Francisco-School of Medicine, Professor of Aviation
Jensen, Mark, M.S.University of Minnesota School of Medicine, Professor of Surgery
** Jerath, Sukhvarsh, Ph.D., University of Illinois, P.E., Professor of Civil Engineering
** Ji, Yun, Ph.D., University of Maine, Associate Professor of Chemical Engineering
* Johnson, Alexander, Ph.D., University of North Dakota, Assistant Professor of Technology
* Johnson, Beverly, D.Sci., Rocky Mountain University, Associate Professor of Physical Therapy
** Johnson, Carol, M.S., University of North Dakota, Instructor of Teaching and Learning
Johnson, Deola, Ph.D., University of North Dakota, Assistant Professor of Social Work
Johnson, Eric, J.D., Harvard Law, Associate Professor of Law
Johnson, Eric L., M.D., University of Nebraska-Omaha, Associate Professor of Family and Community Medicine and Interim Director of the Interprofessional Healthcare Course
Johnson, Ralph M.S., Naval Postgraduate School at Monterey, Assistant Professor of Mechanical Engineering
*** Johnson, Roger, M.S.W., Florida State University, Assistant Professor of Social Work
Johnson, Christopher, Ph.D., University of Edinburgh, Assistant Professor of Philosophy Religion
Johnson, Amber, M.S.N., University of North Dakota, Clinical Instructor of Nursing
** Jones, Arthur F., Ph.D., Case Western Reserve University, Professor of Art Jorgenson, Tera, M.S., University of North Dakota, Assistant Professor of Aviation
** Juntunen, Cindy, Ph.D., University of California-Santa Barbara, Chester Fritz Distinguished Professor of Counseling Psychology and Community Services
Jurich, Donald, D.O., College of Osteopathic Medicine Surgery, Professor of Geriatrics
* Kaabouch, Naima, Ph.D., University of Paris, Associate Professor of Electrical Engineering
*** Kaiser, Stephanie, M.S., University of North Dakota, Clinical Instructor of Nursing
** Kalbfleisch, Pamela J., Ph.D., Michigan State University, Professor of Communication
** Kallio, Brenda, Ed.D., Bowling Green State University, Professor of Educational Leadership
Kapocius, John M., B.S., Park University, CPT, United States Army and Assistant Professor of Military Science and Leadership
# Karan, Mark E., Ph.D., University of Pennsylvania, Adjunct Professor of Linguistics
Kassow, Benjamin, Assistant Professor of Political Science Public Administration
Kaufmann, Russell, MPAS, University of Colorado Health Sciences Center, Assistant Professor of Physician Assistant Studies
Keefe, Timothy, Ph.D., University of Arkansas-Fayetteville, Professor and Chair of Information Systems and Business Education, MBA Program Director
** Keengwe, Jared, Ph.D., Indian State University, Professor of Teaching and Learning
* Kehn, Andre, Ph.D., University of Wyoming, Assistant Professor of Psychology
** Kelsch, Anne, Ph.D., Texas AM University, Professor of History and Director of Instructional Development
** Kelsch, Steven, Ph.D., Texas AM University, Associate Professor of Biology Kemp, Walter, Ph.D., University of Montana, Associate Professor of Pathology
* Kennedy, Aaron, Ph.D., University of North Dakota, Assistant Professor of Atmospheric Sciences
** Kenville, Kimberly, Ph.D., Capella University, Professor of Aviation Klink, Scott, M.S., University of North Dakota, Instructor of Computer Science
Kerr, Darin, Instructor of Theatre Arts
** Khavanin, Mohammad, Ph.D., University of Texas at Arlington, Professor of Mathematics
** Kim, Eunjin, Ph.D., Florida State University, Associate Professor of Computer Science
Kim, Soojung, Ph.D., University of Minnesota, Assistant Professor of Communication
** King, Alan, Ph.D., Louisiana State University, Professor of Psychology
** Kitzes, Adam, Ph.D., University of Wisconsin, Madison, Associate Professor of English
Klose, Patsy, B.S., Jamestown College, Clinical Associate Professor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing and Professional Disciplines
Klug, Marilyn, Ph.D., University of North Dakota, Research Associate Professor of Family and Community Medicine
Knapp, Thyrza, Ph.D., University of Wisconsin-Madison, Assistant Professor of Languages
*** Knight, Andrew, M.A., University of Minnesota, Associate Professor of Music
Kobrinsky, Nathan, M.D., University of Manitoba, Professor of Pediatrics
* Koepke-Nelson, Yvette, Ph.D., University of Illinois at Urbana-Champaign, Associate Professor of English
Kokil, Uttam, M.F.A., Rochester Institute of Technology, Assistant Professor of Technology
** Kolodka, Edward, B.S.CHE., University of North Dakota, Associate Professor of Chemical Engineering
Komprop, Sarah, B.S., University of North Dakota, Clinical Instructor of Nursing
Koponen, Mark A., M.D., University of North Dakota, Associate Professor of Pathology
** Korom, Scott F., Ph.D., Utah State University, Associate Professor of Geology and Geological Engineering
** Kozlak, Evgeni, Candidate of Chemical Sciences, Moscow State University, Professor of Chemistry
Kramer, Barbara, University of North Dakota, Assistant Professor of Social Work
* Krishnamoorthy, Gautham, Ph.D., University of Utah, Assistant Professor of Chemical Engineering
Kristjanson, Arlinda Y., Ph.D., University of North Dakota, Associate Professor of Clinical Neuroscience
Kroetsch, Corey, M.D., University of North Dakota School of Medicine Health Sciences, Instructor of Surgery
Krohn, Kimberly T., M.D., University of North Dakota, Residency Program Director, Center for Family Medicine Minot and Associate Professor of Family and Community Medicine
** Kubatova, Alena, Ph.D., Charles University, Professor of Chemistry
* Labrecque, Michelle, D.P.T., University of North Dakota, Assistant Professor of Physical Therapy
*** Laguette, Soizik, Ph.D., ENGREF-Paris, France, Associate Professor and Chair, Earth System Science and Policy
*** Lamborn, Breann, M.P.A., University of Wyoming, Assistant Professor of Occupational Therapy
* Lawrence, David, Ph.D., University of Chicago, Professor of Philosophy and Religion
Lawrence, Wesley, M.M., University of Cincinnati, Instructor of Music
** Lawson-Body, Assion, Ph.D., Laval University, Professor of Information Systems and Business Education
Lawson-Body, Laurence, Instructor of Accountancy
LeBel, Paul, J.D., University of Florida, Professor of Law, School of Law
** LeFever, Richard, Ph.D., University of California, Associate Professor of Geology and Geological Engineering
** LeMire, Steven, Ph.D., Professor of Educational Foundations Research
* Leach, Melinda, Ph.D., University of California-Los Angeles, Professor of Anthropology
Leber-Gottberg, Rebecca, D.A., University of North Dakota, Assistant Professor of Humanities
** Lee, Jeong Wan, Ph.D., University of Texas at Austin, Professor of Finance
Lee, Kap J., D.V.M., Seoul National University, Director of Biomedical Research Faculty and Professor of Family and Community Medicine
Lee, Kwan Yong, Ph.D., North Carolina State University, Assistant Professor of Economics
* Legerski, Elizabeth, Ph.D., University of Kansas, Assistant Professor of Sociology
* Legerski, John-Paul, Ph.D., University of Kansas, Assistant Professor of Psychology
** Lei, Saobo, Ph.D., University of Alberta, Professor of Basic Sciences
Lennan, Kathleen, Ph.D., University of Wisconsin, Professor of Theatre Arts
** Lesch, William, Ph.D., University of Massachusetts, Professor of Marketing
# Levinsohn, Stephen H., Ph.D., University of Reading, England, Adjunct Professor of Linguistics
Levitt, Ralph, M.D., Northwestern University, Clinical Professor of Internal Medicine, Office of Medical Education
** Lewis, Barbara E., Ph.D., Indiana University, Associate Professor of Music
  * Ley, Aaron, Ph.D., Assistant professor of Political Science
  * Li, Dong (Andrew), Assistant Professor of Accountancy
  * Liang, Lewis, M.S., Delta State University, Associate Professor of Aviation
  * Light, Steven, Ph.D., Northwestern University, Professor of Political Science and Public Administration
  * Lim, Yeo Howe, Ph.D., Memorial University of Newfoundland, Associate Professor of Civil Engineering
  * Lindseth, Glenda, Ph.D., Saint Louis University, Professor of Nursing
  * Lindseth, Paul, Ph.D., University of Michigan, Professor of Aviation
  * Lindseth, Bradley, Ph.D., University of Colorado, Assistant Professor of Electrical Engineering
  * Ling, Kegang, Ph.D., University of Louisiana, Assistant Professor of Engineering
  * Lipp, Leland, Ph.D., University of North Dakota, Adjunct Assistant Professor of Clinical Neuroscience
  * Liu, Jun, Ph.D., Boston College, Associate Professor of Computer Science
  * Lo, Tze Shien, M.D., Kyushu University, Professor of Internal Medicine
  * Loh, Yen Lee, Ph.D., University of Cambridge, UK, Assistant Professor of Physics
  * Lovelace, Kent, M.S., University of North Dakota, Professor of Aviation
  * Lubner, Patrick, M.F.A., University of New Mexico, Professor of Art
  * Lugr, Joseph, M.D., University of North Dakota School of Medicine and Health Sciences, Assistant Professor of Family and Community Medicine
  * Lunak, Zachary, Ph.D., Marquette University, Assistant Professor of Medical Laboratory Science
  * Lunn, Eric R., M.D., University of South Carolina, Associate Professor of Pediatrics
  * Lutz, Dennis J., M.D., Cornell University Medical College, Professor and Chairperson of Obstetrics and Gynecology
  * Mabey, Renee R., Ph.D., University of North Dakota, Professor of Physical Therapy
  * MacGregor, Gay , M.D., University of Iowa College of Medicine, Instructor of Surgery
  * Macejkovic, Cheryl, M.S., University of North Dakota, Clinical Associate Professor of Nursing
  * Madden, John P., Ph.D., Ohio State University, Associate Professor of Communication Sciences and Disorders
  * Mahar, Patricia, Ph.D., University of North Dakota, Associate Professor of Teaching Learning
  * Malott, Daniel, M.B.A., University of Phoenix, Assistant Professor of Aviation
  * Mamaghani, Iraj H., D.Eng., Nagoya University, Associate Professor of Civil Engineering
  * Mann, Michael D., Ph.D., University of North Dakota, Chester Fritz Distinguished Professor of Chemical Engineering
  * Marasinghe, Kanishka, Ph.D., University of Missouri-Rolla, Professor of Physics
  * Marlett, Stephen A., Ph.D., University of California, San Diego, Adjunct Professor of Linguistics
  * Marsh, Ronald, Ph.D., North Dakota State University, Associate Professor of Computer Science
  * Martin, Leslie, M.S., University of North Dakota, Associate Professor Aviation
  * Martin, William, Ph.D., Mississippi State University, Assistant Professor of Marketing
  * Martsof, John T., M.D., Jefferson Medical College-Philadelphia, Professor of Pediatrics
  * Masko, Meganee, M.A., University of Iowa, Assistant Professor of Music
  * Matheney, Ronald K., Ph.D., Arizona State University, Associate Professor of Geology and Geological Engineering
  * Maury, Debra, Ph.D., University of California, Berkeley, Assistant Professor of Languages-Spanish
  * Mavrova Heinrich, Denitsa, J.D., University of North Dakota, Instructor of Law
  * Mayzer, Roni, Ph.D., Michigan State University, Associate Professor of Criminal Justice
  * McBride, Rosanne, Ph.D., University of North Dakota, Assistant Professor of Family and Community Medicine
  * McCann, Lavaun, M.D., University of North Dakota, Clinical Associate Professor of Internal Medicine and Office of Medical Education
  * McCleary, Vikki L., Ph.D., University of North Dakota, Associate Professor of Physician Assistant Studies
  * McDonald, J. Douglas, Ph.D., Professor of Psychology
  * McDonough, Denise, M.D., University of North Dakota School of Medicine and Health Sciences, Assistant Professor of Family and Community Medicine
  * McGinniss, Michael, J.D., College of William and Mary, Marshall-Wythe School of Law, Associate Professor of Law
  * McHugo, Jeanie, Ph.D., University of North Dakota, Director and Assistant Professor of Physician Assistant Studies
  * Meberg, Peter, Ph.D., Northwestern University, Associate Professor of Biology
  * Metzger, Jay, PA-C, University of Nebraska Medical Center, Assistant Professor of Physician Assistant Studies
  * Mewes, John J., Ph.D., University of Oklahoma, Assistant Professor of Atmospheric Sciences
  * Meyer, Mandy, Ph.D., University of North Dakota, Assistant Professor of Occupational Therapy
  * Meyer, Michael E., Ph.D., University of Oklahoma-Norman, Professor of Criminal Justice
  * Meyers, Sarah, M.S., University of Minnesota School of Medicine, Assistant Professor of Pathology
  * Meyerich, John, Associate Professor of Anthropology
  * Mikulak, Marcia, Ph.D., University of New Mexico, Associate Professor of Anthropology
  * Milavetz, Barry I., Ph.D., University of Illinois, Associate Vice President for Research and Economic Development and Professor of Basic Sciences
  * Miller, Charles W., Ph.D., University of Denver-ILIFF School of Theology, Associate Professor of Philosophy and Religion
  * Miller, Elane, M.D., Texas A M Health Sciences Center College Station, Adjunct Associate Professor, Center for Rural Health
  * Miller, Joseph, M.A., University of South Dakota, Associate Professor of Psychology
  * Millsapgh, Richard, Ph.D., University of Oklahoma, Professor of Mathematics
  * Minnotte, Krista Lynn, Ph.D., Utah State University, Professor of Sociology
  * Minnotte, Michael, Ph.D., Rice University, Professor of Mathematics
  * Mishra, Bibhuti, Ph.D., Jawaharlal Nehru University, Research Assistant Professor of Basic Sciences
  * Mitchell, James, M.D., Northwestern University School of Medicine, Chester Fritz Distinguished Professor and Chair of Clinical Neuroscience
  * Mochoruk, James, Ph.D., University of Manitoba, Professor of History
  * Mohr, Peggy M., Ph.D., University of North Dakota, Professor of Physical Therapy
  * Mohr, Thomas M., Ph.D., University of North Dakota, Chester Fritz Distinguished Professor and Chairperson of Physical Therapy
  * Morrison, Steven, J.D., Boston College Law School, Assistant Professor of Law
  * Morrison, Suzanna, M.S., San Jose State University, Assistant Professor of Occupational Therapy
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  * Mukundan, Santosh, Ph.D., Centre for Biotechnology, Anna University, Research Assistant Professor of Basic Sciences
  * Mullen, Gretchen, Ph.D., University of Washington, Associate Professor of Atmospheric Sciences
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  * Munski, Douglas C., Ph.D., University of Illinois, Professor of Geography
  * Murphy, Eric J., Ph.D., Ohio State University, Associate Professor of Basic Sciences
  * Myers, Bradley K., L.L.M., New York University, Professor of Law
  * Nagamoto-Combs, Kumi, Ph.D., University of Rochester School of Medicine, Assistant Professor of Pathology
  * Nam, Seong-Hyun, Ph.D., University of Wisconsin-Milwaukee, Professor of Management
  * Navarro, Rachel, Ph.D., University of Missouri-Columbia, Associate Professor of Counseling Psychology and Community Services
  * Nazir, Kausar, M.D., University of Pakistan, Assistant Professor of Family and Community Medicine
  * Nechaev, Sergei, Ph.D., State Research Institute of Genetics and Selection of Industrial Microorganisms, Assistant Professor of Basic Sciences
  * Nedegaard, Randall, Ph.D., University of Maryland, Assistant Professor of Social Work
  * Neil, Thomas E., Ph.D., Iowa State University, Associate Professor of Computer Science
  * Neil, Patrick, Ph.D., Boston College, Professor of Economics
  * Nelson, Christopher, Ph.D., University of Illinois at Urbana-Champaign, Associate Professor of English
  * Nelson, Susan L., Ph.D., Georgia State University, Professor of Finance
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  * Neubert, Jeremiah, Ph.D., University of Wisconsin, Associate Professor of Mechanical Engineering
  * Neumann, Nicholas H., M.D., Wayne State University, Assistant Dean of Medical School Southwest Campus at Bismarck, Professor of Internal Medicine
** Reiling, David P., Ph.D., University of North Dakota, Associate Professor of Physical Therapy
** Remer, Fred M., M.S., University of Wyoming, Associate Professor of Atmospheric Sciences

Renger, Ralph, Ph.D., University of Calgary Medical School, Professor of Rural Health

** Reza, Hassan, Ph.D., North Dakota State University, Associate Professor of Computer Science

** Rhen, Turk, Ph.D., University of Texas, Austin, Associate Professor of Biology

* Rheude, Elizabeth, M.M., Michigan State University, Associate Professor of Music

** Rhoades, Jesse, Ph.D., University of Illinois at Urbana-Champaign, Associate Professor of Physical Education, Exercise Science and Wellness

** Rice, Daniel R., Ph.D., University of North Dakota, Professor of Educational Leadership

* Richards, Thomas, Ph.D., Washington State University, Assistant Professor of Mathematics

Richotte, Keith, J.D., University of Minnesota, JR., Assistant Professor of Law

Rickett, Julie, Psy.D., Baylor University-Waco, Associate Professor of Family Community Medicine

# Roberts, James S., Ph.D., Georgetown University, Adjunct Professor of Linguistics

* Robertson, Charles L., Ph.D., Capella University, Associate Professor of Aviation

* Robinson, Sarah, Ph.D., University of North Dakota, Clinical Assistant Professor of Communication Sciences and Disorders

** Robison, Lori, Ph.D., Indiana University, Associate Professor of English

* Rocha, Samuel, Ph.D., Ohio State University, Assistant Professor of Educational Foundations and Research

Roerig, James L., PharmD., University of Minnesota, Professor of Clinical Neuroscience

** Romanick, Mark A., Ph.D., University of North Dakota, Professor of Physical Therapy

** Romsdahl, Rebecca J., Ph.D., George Mason University, Associate Professor of Basic Sciences

** Rosenberger, Thad A., Ph.D., Ohio State University, Associate Professor of Basic Sciences

Ross, Eric, Ph.D., University of Washington, Assistant Professor of Languages

Rovtov, Glenda, Ph.D., University of North Dakota, Associate Professor of Information Systems and Business Education

* Routon, Claudia, Ph.D., University of Nebraska, Associate Professor of Languages

* Rozelle-Stone, Rebecca, Ph.D., Southern Illinois University, Associate Professor of Philosophy Religion

Ru, James, University of North Dakota, Assistant Professor of Family and Community Medicine

* Ruit, Kenneth G., Ph.D., Loyola University of Chicago, Assistant Dean for Undergraduate and Graduate Education and Associate Professor of Basic Sciences

** Rundquist, Bradley, Ph.D., Kansas State University, Professor of Geography

** Ruthig, Danielle, Ph.D., University of Manitoba, Professor of Psychology

* Rygalov, Vadim, Ph.D., Institute of Biophysics, Krasnoyarsk State University, Russian Academy of Sciences, Siberia, Associate Professor of Space Studies

* Sabato, Todd, Ph.D., University of Southern Carolina, Assistant Professor of Kinesiology Public Health Education

* Sage, Melanie, Ph.D., Portland State University, Assistant Professor of Social Work

Sahmoun, Abe, Ph.D., Mediterranean University, Associate Professor of Internal Medicine

Sailer, Frances, Ph.D., University of North Dakota, Assistant Professor of Microbiology and Immunology

** Salehfar, Hossein, Ph.D., Texas AM University at College Station, Professor of Electrical Engineering

Sandberg, Scott, DMA, University of Iowa, Assistant Professor of Music

** Sauer, Michelle, Ph.D., Washington State University, Professor of English

* Scharf, Elizabeth, Ph.D., University of Washington, Associate Professor of Anthropology

Schauser, Janet, M.S., University of Minnesota, Clinical Associate Professor of Nursing

Schauser, Roger W., M.D., Wayne State University School of Medicine, Detroit, Associate Professor of Family and Community Medicine and Director, Predoctoral Medical Education

* Schill, Janna, M.S., University of North Dakota, Assistant Professor of Medical Laboratory Science

Schlecht, Kristina, M.D., University of North Dakota School of Medicine and Health Sciences, Assistant Professor of Family and Community Medicine

** Schlosser, Isaac, Ph.D., University of Illinois, Chester Fritz Distinguished Professor of Biology

# Schmidt, Clint S., Ph.D., University of Minnesota, Adjunct Assistant Professor of Microbiology and Immunology

** Schneweis, Carol, M.S.W., University of North Dakota, Assistant Professor of Social Work

** Schroeder, Tim, Re.D., Indiana University, Associate Professor of Recreation and Leisure Services

Schroeder, Shawnda, Ph.D., University of North Dakota, Assistant Professor of Population Rural Health

** Schultz, Patrick, Ph.D., Texas Tech University, Associate Professor or Management

Schumacher, Peter, M.S., Embry-Riddle Aeronautical University, Associate Professor of Aviation

** Schwalm, William, Ph.D., Montana State University, Professor of Physics

Schwartz, Gary, Ph.D., State University of New York at Buffalo School of Medicine, Professor Population Health

** Seames, Wayne, Ph.D., University of Arizona-Tucson, Professor of Chemical Engineering

** Seddoh, Samuel, Ph.D., University of Iowa, Associate Professor of Communication Sciences Disorders

** Seelan, Santhosh, Ph.D., Jawaharlal Nehru Technological University, Professor and Chair of Space Studies

** Semke, William, Ph.D., University of Wisconsin-Madison, Professor of Mechanical Engineering

* Semmens, Karen, M.S., University of North Dakota, Clinical Assistant Professor of Nursing

** Sens, Donald A., Ph.D., University of South Carolina, Professor of Pathology

** Sens, Mary Ann, M.D., Ph.D. Medical College of South Carolina, Professor and Chair of Pathology

** Shabb, John B., Ph.D., West Virginia University, Associate Professor of Basic Sciences

** Shafer, Jill, Ph.D., Texas AM University, Assistant Professor of Teaching and Learning

** Shafer, Richard, Ph.D., University of Missouri, Professor of Communication Shanta, Linda, Ph.D., Touro University International, Clinical Associate Professor of Nursing

** Sharma, Jyotika, Ph.D., Jawaharlal Nehru University, Assistant Professor of Basic Sciences

** Sheridan, William F., Ph.D., University of Illinois, Chester Fritz Distinguished Professor of Biology

* Shogren, Mariede, M.S.N., Case Western Reserve University-Cleveland, Clinical Assistant Professor of Nursing

** Short, Martin, Ph.D., University of Florida, Associate Professor of Physical Education, Exercise Science and Wellness

** Short, Sandra, Ph.D., Michigan State University, Professor of Physical Education, Exercise Science and Wellness

Sickler, Alexander, J.D., George Washington University, Assistant Professor of Law

# Sikorski, William A., Ph.D., University of North Dakota, Adjunct Assistant Professor of Educational Foundations and Research

Sikkema, Joanna, D.N.S., Case Western Reserve University-Cleveland, Clinical Assistant Professor of Nursing

** Simlai, Prodosh K., Ph.D., University of Illinois, Associate Professor of Economics

** Simmons, Rebecca, Ph.D., University of Minnesota, Associate Professor of Biology

** Singh, Brij B., Ph.D., Bhopal University-Bhopal, Professor of Basic Sciences

Skramstad, Linda, M.S.N., University of North Dakota, Clinical Assistant Professor of Nursing

# Slater, Keith, Ph.D., University of California, Santa Barbara, Adjunct Professor of Linguistics

** Smart, Kathy, Ed.D., University of North Dakota, Associate Professor of Teaching and Learning

** Smith, Bruce, Ph.D., Florida State University, Dean, John D. Odegard School of Aerospace Sciences, and Professor of Aviation

** Smith, Wesley, M.F.A., Texas Tech University, Associate Professor of Art and Design

** Smith, William S., Ph.D., University of Alabama, Associate Professor of Finance

** Smolikova, Irina, Chemical Sciences Degree, Zelinsky Institute of Organic Chemistry, Russian Academy of Science, Professor of Chemistry

# Snider, Keith L., D.Litt., Leiden University, Adjunct Professor of Linguistics
Wang, Dongmei, Ph.D., Research Institute Petroleum Exploration Development, Assistant Professor of Geology Geological Engineering

Wang, Xinchun, Assistant Professor of Marketing

** Watt, John A., Ph.D., Montana State University, Associate Professor of Basic Sciences

** Weatherly, Jeffrey, Ph.D., Washington State University, Professor of Psychology

** Weaver-Hightower, Marcus, Ph.D., University of Wisconsin, Professor of Educational Foundations and Research

** Weaver-Hightower, Rebecca, Ph.D., University of Kentucky, Associate Professor of English

* Weber, Brett, Ph.D., University of Utah, Associate Professor of Social Work

# Weber, David, Ph.D., University of California, Los Angeles, Adjunct Professor of Linguistics

# Wei,Lin, Ph.D., University of Syracuse, Adjunct Professor of Linguistics

Weiland, Tim, M.D., Mayo Medical School, Assistant Professor of Pathology

** Weinstein, Jack, Ph.D., Boston University, Professor of Philosophy and Religion

Weisz, Shari, Clinical Assistant Professor of Communication Sciences Disorders

Weidt-Basson, Helene, Ph.D., Columbia University-NY, Professor of Languages

Wells, Sandra, M.S.N., University of Texas, Arlington, Clinical Assistant Professor of Nursing

Westereng, Steven, M.A., University of Minnesota, Assistant Professor of Family and Community Medicine

** Wettersten, Kara, Ph.D., University of Kansas-Lawrence, Associate Professor of Counseling Psychology and Community Services

Wheatley, John R., B.S., University of Texas-El Paso, SFC, United States Army and Assistant Professor of Military Science and Leadership

** Whitcomb, David, Ph.D., State University of New York at Buffalo, Assistant Professor of Counseling Psychology and Community Services

White, Frank, M.A., University of North Dakota, Assistant Professor of Sociology

** Whitehead, James R., Ed.D., Arizona State University, Professor of Physical Education, Exercise Science and Wellness

** Widmer, Donovan, M.F.A., Illinois State University, Associate Professor of Art

Wild, Brandon, M.B.A., Embry Riddle Aeronautics University, Assistant Professor of Aviation

Willis, Karin, M.D., University of North Dakota, Assistant Professor of Family and Community Medicine

** Wilsnack, Sharon C., Ph.D., Harvard University, Chester Fritz Distinguished Professor of Clinical Neuroscience

** Wise, Richard, Ph.D., Catholic University of America, Associate Professor of Psychology

** Wittgraf, Michael, D.Mus.: Northwestern University, Professor of Music

** Wolfe, Eric, Ph.D., Indiana University, Associate Professor of English

** Wonderlich, Stephen, Ph.D., University of Missouri, Chester Fritz Distinguished Professor and Associate Chair of Clinical Neuroscience

Wonderlich, Stephen, Ph.D., University of Missouri, Professor of Psychiatry Behavioral Science

* Wood, Robert, Ph.D., University of Washington, Associate Professor of Political Science and Public Administration

** Worley, Deborah, M.S., University of Mississippi, Associate Professor of Educational Leadership

Worley, Paul, Ph.D., University of North Carolina, Chapel Hill, Assistant Professor of Languages

** Wu, Min, Ph.D., University of Leeds School, Professor of Basic Sciences

** Wynne, Joshua, M.D., Boston University, Vice President for Health Affairs and Dean of the School of Medicine and Health Sciences and Professor of Internal Medicine

** Xi, Baike, Ph.D., Pennsylvania State University, Research Professor of Atmospheric Sciences

Xiao, Feng, Ph.D., Assistant Professor of Civil Engineering

* Xie, Linglin, Ph.D., Kansas State University, Research Assistant Professor of Basic Sciences

* Yang, Crystal, Ph.D., University of Georgia, Associate Professor of Art Design

Yang, Wei, Assistant Professor of Economics

* Yarbrough, Lance, Ph.D., University of Mississippi, Associate Professor of Geology

** Yearwood, David, Ph.D., University of North Dakota, Professor of Technology

** Young, Timothy R., Ph.D., University of Oklahoma, Professor of Physics

Youngs, Linda F., M.A., University of North Dakota, Clinical Instructor of Nursing

** Yurkonis, Kathryn, Ph.D., Iowa State University, Assistant Professor of Biology

** Zahui, Marcellin, Ph.D., Western Michigan University, Associate Professor of Mechanical Engineering

Zeidlik, Thomas, M.S., University of North Dakota, Associate Professor of Aviation

Zeidlik, Raquel, Clinical Instructor of Nursing

Zelewski, Susan, M.D., Baylor College of Medicine, Assistant Dean for Medical School, Northeast Campus at Grand Forks, Clinical Associate Professor of Pediatrics

** Zerr, Ryan J., Ph.D., Iowa State University, Professor of Mathematics

* Zhang, Ke (Kurt), Ph.D., Kansas State University, Associate Professor of Pathology

** Zhang, Xiaodong, Ph.D., Dalhousie University, Canada, Associate Professor, Earth System Science and Policy

** Zhang, Jianglong, Ph.D., University of Alabama, Associate Professor of Atmospheric Sciences

** Zhao, Xiaojun (Julia), Xiaojun, Ph.D., Jilin University, China, Professor of Chemistry

* Zheng, Haochi, Ph.D., University of Minnesota, Assistant Professor, Earth System Science and Policy

Zheng, Yun (Lucy), M.D., Luzhou Medical College, Assistant Professor of Pathology

Zhu, Weizhu, M.D., Zunyi Medical College, Research Assistant Professor, Research Affairs

** Zidon, Margaret, Ph.D., University of North Dakota, Associate Professor of Teaching and Learning

Ziegler, Cathy, B.S., South Dakota State University and B.S. in Physical Therapy, University of Oklahoma Health Sciences Center, Instructor of Family and Community Medicine

Ziejelewski, Mariusz, Ph.D., North Dakota State University, Adjunct Associate Professor of Clinical Neuroscience

** Zimmerman, Sonia, Ph.D., North Dakota State University, Associate Professor of Occupational Therapy

** Zuo, Yangjun, Ph.D., University of Arkansas, Professor of Information Systems Business Education
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